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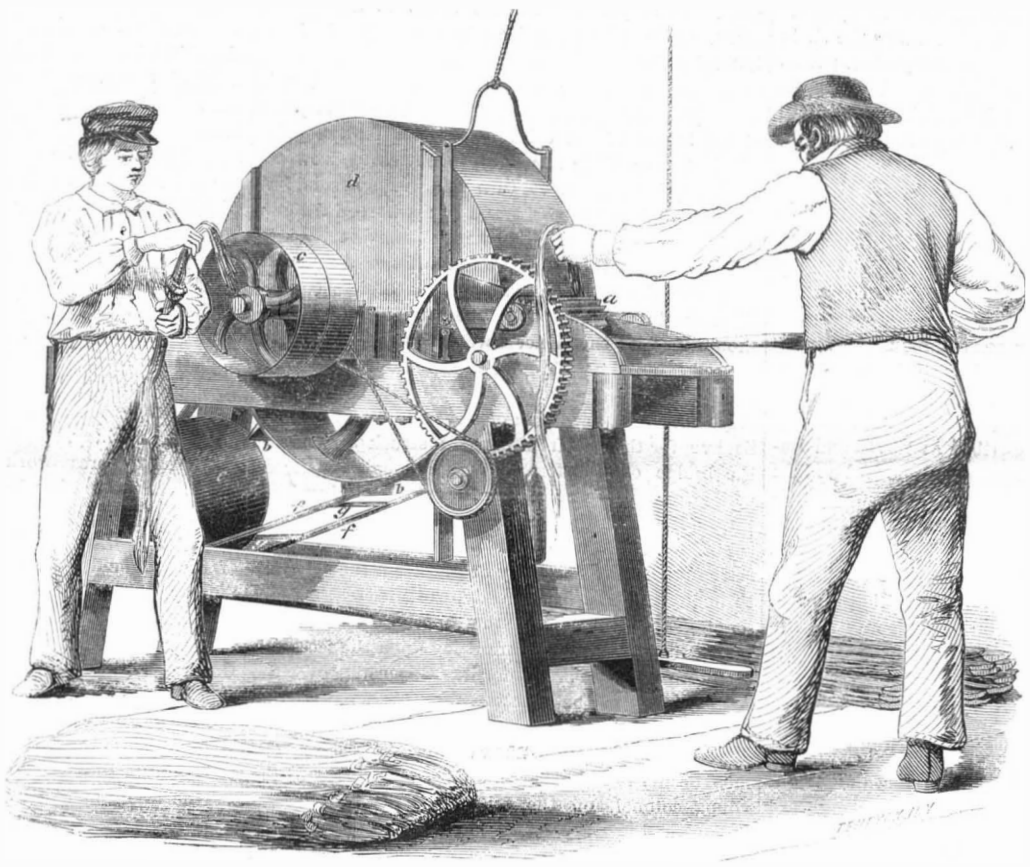
VOL. IV.---NO. 23. NEW YORK, JUNE 8, 1861. NEW SERIES.

Machine for Making Sisal Hemp.

There is no field of invention which promises larger results than the adaptation of some vegetable fiber to manufacture into articles of clothing, cordage, paper, &c. We are anticipating as possible, and, indeed, as not altogether improbable, the advent at any time of an invention in this line, the stupendous effects of which will equal those of Whitney's cotton gin. Though flax has received a larger share of the attention directed to this subject than any other plant, there are many others which have not been entirely overlooked, and among these are the *Agave Americana* or *Planto de Queniquuen*. This is a tropical plant, growing spontaneously in Yucatan, Cuba, Florida and other places, in great abundance, and yielding two crops a year. The leaves of this plant are composed of fibers similar to those of hemp, but these fibers are covered by the fleshy part of the plant. When this fleshy portion is removed, the fibers form what is known in our markets as "sisal hemp," and attempts have been made to remove it by machinery, but it adheres so firmly to the fiber that all these attempts have been heretofore unsuccessful. After numerous experiments, Edward Juanes y Patrullo, of Merida, in the State of Yucatan, and Republic of Mexico, has succeeded in contriving a machine which accomplishes the work perfectly. This machine is illustrated in the accompanying engraving.



PATRULLO'S MACHINE FOR MAKING SISAL HEMP.

The leaves, divided into strips of suitable width, are fed in between two fluted rollers, *a*, when they are struck by the beaters, *b b*, upon the drum, *c*, and carried up over the drum between it and the cap, *d*, the cap serving to hold the leaves down so that they may be acted upon by the beaters. One-half of the beaters have serrated or comb-shaped edges, while the edges of the other half are plain, the two kinds being arranged alternately. The smooth edges break the fleshy coating of the leaves, and it is then scraped off by the beaters with the serrated edges. Each strip is fed in until half of it is dressed, when the upper fluted roller is raised by depressing the treadle, *e*, and the strip is reversed to complete the dressing.

As the beaters are liable to collect the matter which they scrape from the leaves, provision is made for keeping them clear. To this end, two narrow belts, *ff*, connected by metallic bars, *g*, are run beneath the drum, *c*, in such proximity that they will scrape the beaters and keep them clean.

This valuable invention has been secured by two patents, dated March 5, 1861, and April 23, 1861, through the Scientific American Patent Agency, and applications have also been made for patents in some of the foreign countries.

Further information in relation to the matter may be obtained by addressing the inventor at No. 20 Lispenard-street, New York.

On Filtration---A New Medium.

A paper on this important subject was lately read before the London Society of Arts by J. C. Dahlke. He stated that the Egyptians and Chinese used filters of unglazed earthenware and porous stone. In the beginning of the Eighteenth century, the French began to pay attention to this subject, and first employed wool, cotton and sponge for filtering media. About 70 years ago, filters were introduced into England containing three layers of media, namely, sand, gravel and charcoal. These were used by the water passing directly down through them. Charcoal alone has now become the most common filtering medium. Animal charcoal is the most efficient substance, as it filters water about three and a half times faster than sand or common charcoal. Its principal component parts are lime and charcoal, and these are so combined as to secure very minute and extended porosity. It is scarcely possible to keep water stored up in cisterns entirely free from contamination. A filter combining the quality of chemical purification, such as removing lead from the water, and mechanical separation of impurities, has not yet been made, and perhaps it is an impossibility. To remove lead that may have been taken up by the water in a well or cistern, Professor Faraday recommends the practice of mixing some animal charcoal with the water, stirring all up, and then allowing the whole to settle. The charcoal will, in this manner, separate the lead from the water. It has been found that water which contains much sulphate of lime and magnesia tends to derange the process of digestion. No filtering medium for such water is equal to animal charcoal—that made from bones burned in close retorts—but it is expensive for very general use. As a substitute for animal charcoal, Mr. Dahlke has found that the residue of Boghead coal, obtained after it is distilled for coal oil, answers a most excellent purpose. When well burned, it removes the color and offensive smell of impure water.

We have no doubt but, by mixing a small quantity of clay and lime with common cannel coal, and burning them in a retort, a very superior filtering medium would be obtained. All the water used in our cities should be passed through large filtering beds before it is distributed for consumption. In winter, this is scarcely necessary, but in summer, when so much organic matter finds access to river and pond water, it frequently becomes very impure. Sufficient attention has not yet been paid to the filtering of water upon a large scale for cities and villages.

AN EXPERIMENTAL SHIP.—The Gloucester (England) *Chronicle* thus describes a peculiar vessel which lately arrived in that town with a load of timber. It says:—"The ship *Louisa*, of London, Captain Williams, now unloading timber at Messrs. Nicks & Co.'s wharf, is deserving the inspection of those who take an interest in naval architecture. The lines of the ship are precisely alike, both fore-and-aft—that is, assuming the mainmast to be half way between the bow and the stern, the shape of the fore and the after body is the same. The rudimentary principles of the ship may be described as a segment of a circle, and this is presented in every part, the keel being the only straight line in the hull. The construction of the ship, as well as the principle of construction, is also novel; instead of a frame covered by a skin of planks outside, and another skin inside, the hull is formed by solid logs covered with felt, and is sheathed with diagonal planking and coppered. The *Louisa* is rigged something, though not exactly, like a three-masted schooner, but holds large square-sails on the mainmast, with studding sails when going free; and finally, she is steered by chains acting on the rudder, similarly to the yoke lines of a boat. The vessel is very deep waisted, the forecastle and quarter-deck rising up like those of a Dutch galliot. She is very fast; goes on a wind ten knots, and off the wind, even thirteen; and her bottom being an inclined plane, she rises and glides over the water, instead of through it, without making any wash beyond a small jet where the cutwater strikes. She is a capital seaboat, dry and easy, and steers well; indeed, if she did not, her steering apparatus, having very much less power than the ordinary wheel and rudder, would not control her. The ship's measurement is 244 tuns, but she takes 400, and is so buoyant that she can scarcely be overweighed. She is 153 feet long and 23 feet broad.

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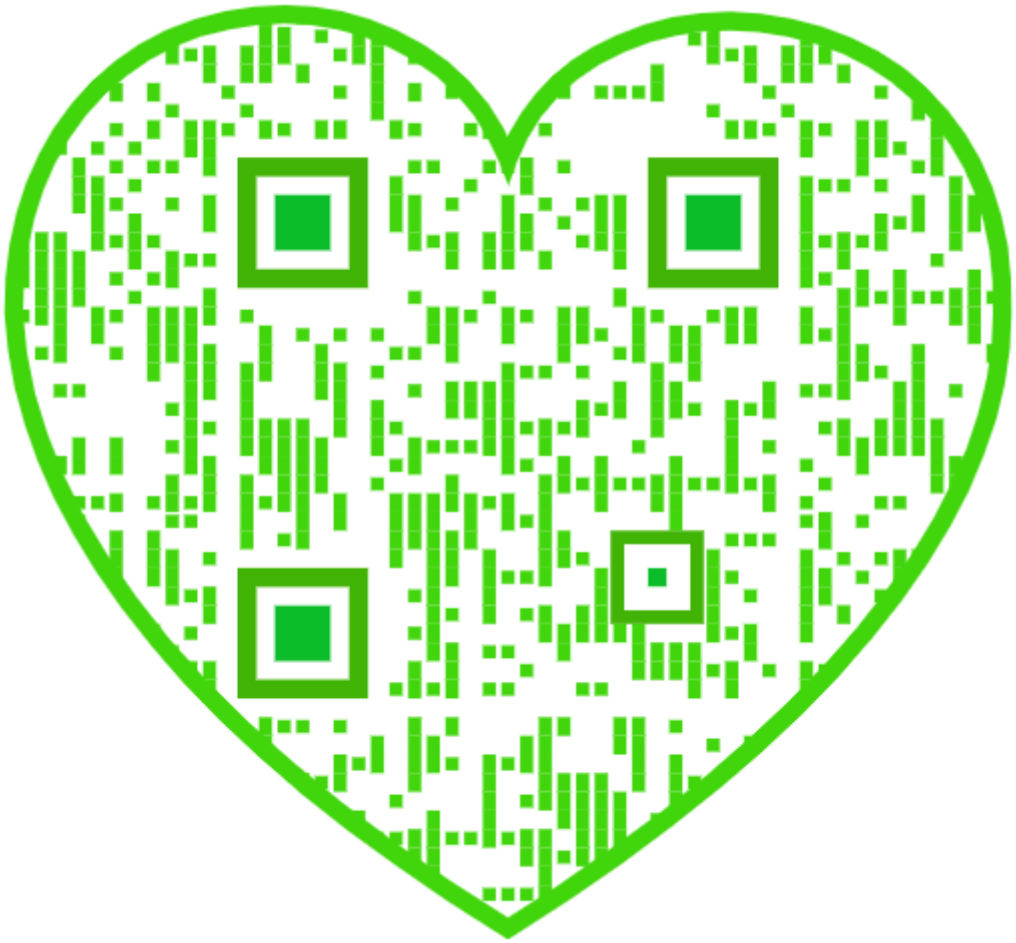

CHANGE OF MAIL DAY.

With a view of presenting the latest intelligence from the seat of war, we shall hereafter mail the SCIENTIFIC AMERICAN on Friday instead of Tuesday. By this change the SCIENTIFIC AMERICAN will have as late war news as any other weekly paper.

It is the intention of the publishers to keep up with the times, in news and in illustrations of new inventions pertaining to warfare, and at the same time, illustrate and describe all new inventions and discoveries which may be considered important in any department of mechanics or science. The publishers trust that all subscribers whose term for which they prepaid are about expiring, will renew their subscriptions.

THE WAR.

The 24th of May, 1861, is a date which will occupy a prominent position in the history of the United States; for on this day the government made its first step in advance to put down the disunion party that is seeking by force of arms to break up and destroy the nation. Thirteen thousand troops were sent from Washington and its vicinity across the Potomac river into Virginia. The advance was made in the latter part of the night of the 23d and 24th at three points; from Georgetown, across what is known as the chain bridge at the mouth of the Potomac Aqueduct; from Washington across the Long Bridge; and down the river by steamboat to Alexandria, which is a small town about six miles below Washington, on the right bank of the Potomac.

THE CROSSING FROM GEORGETOWN.

The New York Sixty-ninth and Twenty-eigth regiments, with Lieutenant Drummond's cavalry and a battery passed the Chain Bridge about midnight. They took possession of Arlington Hights, where they have since thrown up intrenchments.

THE CROSSING AT LONG BRIDGE.

The main body crossed at the Long Bridge. It consisted of about 8,000 infantry, with two companies of cavalry of the regular army, and Sherman's flying artillery. The scene is described as novel and impressive in the extreme. It was as beautiful a night as ever was seen, the air was still, the sky was cloudless and the moon at the full, and in the latitude of Washington, the latter part of May is the pleasantest season of the year. As the troops crossed, the Michigan regiment and Sherman's artillery turned down to the left for Alexandria, while most of the others turned up the river to the right, to occupy the hights opposite Washington.

TAKING OF ALEXANDRIA.

At two o'clock in the morning, Commander Dahlgren appeared at the camp of Colonel Ellsworth's regiment of Zouaves, and informed them that it was time to move. They immediately embarked on board the steamboats *Baltimore* and *Mount Vernon*, and were carried slowly down the river to Alexandria, where they arrived at half-past five o'clock. They immediately landed, formed in double quick time, and marched up into the town, meeting with no resistance. It seems that the commander of the *Pawnee* had sent a flag of truce into the town a short time before, giving the secession forces an hour to leave. They had accordingly prepared a train of cars and steamed away as our troops entered the place. As the Michigan regiment, however, came in with the artillery, they caught 36 members of a cavalry company, dressed in very gay uniforms, with plumes in their caps. These gentlemen, when first called on to surrender, demanded time for consideration, but as the battery thundered up and wheeled into position, they concluded to surrender at discretion. They were taken to Washington, and confined in the navy yard, where their short and grum answers excited considerable mirth.

THE DEATH OF COLONEL ELLSWORTH.

On landing, Col. Ellsworth, the commander of the Zouaves, after giving some hasty directions to destroy the railroad track, started for the telegraph office to cut the wires leading to the South. At first he was accompanied only by the military secretary of the regiment, Mr. H. J. Winser; the chaplain, Rev. E. W. Dodge, and the reporter of the New York *Tribune*; but he stopped and called forward a single squad, with a sergeant from the first company. The party proceeded quickly through the streets, meeting a few bewildered citizens who had just risen in the early morning, and were about to turn towards the telegraph office, when the colonel caught sight of a large secession flag on the Marshall House, a second class inn, though the principal one of the village. This is the identical flag which has so long been waving in sight of the White House at Washington, and has been the subject of much comment. Some ten days previously, Senator Wade, of Ohio, looking at it through a telescope from the White House, remarked to the President that it was provoking to see it so near the capital. As Colonel Ellsworth saw it on the hotel he observed, "It must come down," and, sending back the sergeant for the entire first company, he turned towards the hotel. At the open door he met a man in his shirt and trousers, of whom he demanded what sort of flag it was that hung above the roof. The man, who seemed much alarmed, replied that he knew nothing of it; and that he was only a boarder there. Without further words, the colonel sprung up the staircase, followed by his company, six in all besides himself. When they reached the attic, Colonel Ellsworth took Mr. Winser's knife, and, clambering up a ladder to the roof, cut down the flag and brought it down under his arm. The party then descended, private Brownell leading the way and the colonel next. As they descended the stairs to the second story, a man, who proved to be the landlord of the hotel, by the name of Jackson, rushed out of a dark passage with a double barreled gun in his hand, and, scarcely observing Brownell, presented his gun square at the breast of the colonel, who was on the stairs within two or three steps of the bottom. Brownell made a quick motion to turn the weapon aside, but the fellow's hand was firm, and he discharged the gun straight to its aim, sending the contents directly into Colonel Ellsworth's breast, who fell forward upon his face, with the dull, heavy sound of a lifeless corpse. The assassin then instantly turned upon Brownell to shoot him with the other barrel, but the Zouave was too quick for him. Though the sound of their guns seemed to those present to be simultaneous, there must have been a fraction of a second in favor of the Zouave, for the ball from his rifle struck Jackson at the bridge of the nose, passing through his head, while the contents of Jackson's gun passed just over Brownell's head and entered the panel of a door behind him. Brownell, not knowing the fatal character of his shot, instantly drove his sabre bayonet through Jackson's falling body, the force of the blow sending the body down the upper section of the second flight of stairs, where it lay upon the face with the gun firmly clasped under it. On turning over the body to remove the gun the face was exposed, displaying a wound too horrible for description, and exhibiting the features fixed in an expression of the most deadly rage and hate. The countenance of the young colonel, on the other hand, was perfectly serene, and, except for the palor that comes with death, was as natural as in sleep. The surgeon of the regiment soon arrived, and, a litter of muskets being arranged, the body was carried to the steamboat and taken to Washington.

THE GRIEF FOR COLONEL ELLSWORTH.

Elmer E. Ellsworth, the young soldier who was thus suddenly cut off, was 24 years of age. He was born in Mechanicsville, in this State; was employed for a time in one of the large mercantile establishments in this city, and then went to Illinois, where he organized the famous company of Chicago Zouaves, who attracted so much attention on their visit to New York last summer. Mr. Ellsworth studied law for a time at Springfield, Ill., in the office of Abraham Lincoln, now President of the United States; and when the President went from Springfield to Washington, he was accompanied by his handsome student, whose graceful and manly bearing, and energetic attention to the comfort of the party, was the subject of much comment along the route. On the breaking out of the war he solicited permission to raise a regiment of zouaves among the firemen of New York, a service which he accomplished in one week. Many circumstances combined to cause very wide spread grief at the news of his death; he was extensively known among various classes and in many places; and then his youth, his accomplishments, his gallantry and the brilliancy of his hopes were peculiarly calculated to impress all with sorrow at the suddenness of his departure. As the sad intelligence was flashed over the country, not only in his native town, but in Washington, in New York, and in many other places, flags were lowered to half mast, and all the usual signs of public mourning were manifested. The body was taken to Mechanicsville for interment, attended by magnificent funeral services on its way, both in Washington and in this city. The President of the United States and other public men formed a part of the procession that followed the body to the cars in Washington, and in New York the most prominent citizens were pall bearers, and it seemed as if all of the inhabitants turned out either to form a part of or to witness the procession. The body arrived in this city on Sunday morning, May 26th, where it was met by the parents; it lay in state in the City Hall from 11 to 1 o'clock, when it was borne through some of the principal streets to the steamboat *Francis Skiddy*, on which it moved up the North river toward its last resting place.

BROWNELL THE AVENGER.

Among the guard of honor detailed to escort the remains of Colonel Ellsworth was the soldier who so swiftly avenged his death. He marched in the funeral procession in this city, with the captured secession flag fastened to the bayonet with which he slew the assassin of his commander. His name is Francis E. Brownell, he is from Troy, N. Y., and is about twenty years of age. Without the least swagger he walked with an air of unaffected grief, the object of the most absorbing interest to the countless thousands who watched the procession. As the word ran along the lines that Brownell was coming, every one seemed determined to get a glimpse of him, and the crowd surged in upon the lines, completely overpowering the police. The whole multitude seemed possessed with a strong and deep emotion, and all held their breath in hushed silence, fixing their eyes on the prompt avenger as he slowly passed along.

THE REPORTED ATTACK ON THE STEAMER "BALTIMORE."

This report, in regard to the truth of which we intimated doubts in our last issue, proves to have been a heartless hoax. No such attack took place.

FORTIFYING OPPOSITE WASHINGTON.

The troops which were sent into Virginia on the morning of Friday, May 24th, immediately commenced throwing up breastworks on the commanding positions, under the directions of the educated officers of our regular army. The work was busily prosecuted through Saturday and Sunday. The chaplain of one of the regiments, after conducting divine service on Sunday, shouldered a spade and led the way to the trenches.

A new military department has been formed by General Scott out of that portion of Virginia lying east of the Alleghanies and north of James river, exclusive of Fortress Monroe and vicinity, and Brigadier General McDowell has been appointed to its command. He is one of the most loyal, able and energetic officers of the army, and will certainly do credit to the important post of which he has just taken charge.

REINFORCING THE ADVANCE.

Additional forces continue to be dispatched daily across the river, by the Long Bridge, while others are sent down by steamboat to Alexandria. It is said to be understood, however, that further advances upon Virginia soil will not be made by the army concentrated at Alexandria and on Arlington Heights, until the government has gathered sufficient forces to make simultaneous movements upon the secessionists from other points.

GENERAL BUTLER'S OPERATIONS.

Major-General B. F. Butler has received the command of the military district of Eastern Virginia, embracing Fortress Monroe. The secessionists have erected batteries along the York and James rivers, which are powerfully armed with the guns taken from the Norfolk Navy Yard. Fortress Monroe is situated at the extremity of the peninsula formed by the rivers named, and Richmond, the capital of Virginia, is situated at the head of navigation on James river, 150 miles from its mouth, measured by the channel. General Butler is operating to clear the two rivers, and the strip of country between them of the secession forces, preparatory to an advance on Richmond, or as part of the plan for cutting off the communications with Norfolk, and retaking the Navy Yard at that place. On Monday, May 27th, General

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Butler ordered 2,500 men, with five vessels, under convey of the *Harriet Lane*, to proceed to a point near the mouth of James river, called Newport News. He commenced work immediately by throwing up fortifications and entrenchments. The position is a most favorable one, and he will be able to hold it against all comers. The last transport was fired at by the Sewall's Point rifled cannon, but the range was too great to be effective.

General Butler has resigned his commission as Brigadier General of the Massachusetts militia, and has been appointed Major General in the United States army, commanding at Fortress Monroe and the military department of that region. If Ben has his health, he will give the secessionists a vast deal of trouble. He is a bold, shrewd operator, and is fully armed with a knowledge of war, besides being a profound lawyer. He is not to be easily caught in a trap.

MOVEMENTS IN WESTERN VIRGINIA.

Harper's Ferry is situated among the mountains on the line of the Baltimore and Ohio Railroad, 81 miles from Baltimore on the east, and 198 from Grafton on the west. At Grafton the road divides, one branch continuing due west 104 miles to Parkersburgh on the Ohio river, and the other extending northwesterly to Wheeling, also on the Ohio. The secessionists, who hold Harper's Ferry in force, have allowed trains of cars to run over the roads regularly; but on the 27th of May, learning that General McClellan, who has command of the Ohio forces, had taken up his march for Wheeling and Parkersburgh, they blew up three of the bridges on the road west of Grafton. They have also thrown down upon the track an immense mass of stone, called Ballman's Rock, 10 miles to the east of Harper's Ferry. Twenty-five locomotives belonging to the road were thus caught at Harper's Ferry.

MOVEMENTS AT THE WEST.

On the western side of the Mississippi river, opposite Cairo, is Bird's Point, where a portion of the ground is slightly elevated above the surrounding swamp. A railroad runs from this place in a southwesterly direction, 26 miles to Sikeston, making the point easily accessible from a large district in Southeastern Missouri. It has been decided by Government to occupy Bird's Point, and on the 27th of May orders were received at St. Louis for the transfer of one regiment of General Lyon's brigade to that place.

OPERATIONS OF THE SECESSIONISTS.

From numerous sources we hear of very rapid concentration of troops in Virginia, mostly at Richmond, Harper's Ferry, and the vicinity of Norfolk. At Mansassas Junction, some 20 miles southwest from Washington, disunion forces are throwing up breastworks, and at this place the opposite outposts are within a few miles of each other. We again close our summary with the anticipation of severe fighting in Virginia.

Naval Intelligence.

The Secretary of the Navy gives notice that a Board of naval engineers is now in session at the New York Navy Yard for the examination of candidates for admission into the Engineer's Corps of the Navy. Qualified engineers wishing to enter the naval service in either of the grades of First, Second, or Third-Assistant Engineer, will present themselves before this Board, by whom they will be examined in accordance with the instructions and regulations governing the admission of candidates to these grades.

Captain Lee, of the United States Navy, in command of the *Vandalia*, ordered to the East Indies, learning, at the Cape of Good Hope, of the breaking out of the secession war, decided to return home with his ship. The *Vanddia* is now at the Brooklyn Navy Yard.

The Union Vote in Virginia.

The following are a part of the election returns of Western Virginia against the ordinance of secession:

Counties.	*Votes.*	*Counties.*	*Votes.*
Berkeley	700	Barbour	350
Harrison	1,000	Taylor	700
Wood	1,696	Marion	350
Morgan	400	Wetsall	100
Ritchie	378	Mason	1,700
Loudon	1,000	Cabbell	450
Jackson	400	Kanawha	1,200
Wirt	300	Wayne	800
Pleasants	158	Preston	500
Doddridge	550		

We shall probably not know much about the vote in Eastern Virginia, where the secessionists had it all their own way.

Grand Military Encampment.

Upon the occasion of the visit of Queen Victoria to the Emperor of France in 1855, the military display was gorgeous beyond description. The grand encampment at Boulogne numbered, if we recollect rightly, 60,000 men, and 100,000 soldiers were under arms, and took part in honoring the British Queen. When the King of Portugal visited the Emperor the same year, the grand review at Champ Mars was composed of 40,000 infantry and 8,000 calvalry. Those who witnessed the spectacle will never forget it.

Such sights as these are strange to most of our people—thus far we have been content to follow peace, which has kept the military spirit of our people in subjection. We have had no entrenched camp as at Aldershott in England and Chalons in France; but it appears now that our citizens will soon be able to view a spectacle such as has never before been presented on this continent. The Southern revolution will have the effect to make us a military nation, and a large standing army will need to be maintained, ready to obey with swift alacrity the call of the government. Our volunteers are brave and hardy men, but they need discipline and thorough training to fit them to do work assigned to an army.

It is rumored that the government contemplates the formation of three grand camps—one in Ohio, one in Pennsylvania, and one near this city. The last was commenced on the 20th ult. on Staten Island, and the work is being rapidly pushed forward. The location is the extensive plateau a mile south-easterly from Port Richmond, extending from the line of Doctor Post's house to New-Dorp Lane, and running with a gradual slope to the waters of the Lower Bay. The tract is nearly square, comprises about 10,000 acres, is well furnished with wood and water, and is in every respect well adapted to the purpose in view. On this great natural parade-ground there is ample space for the evolutions of 60,000 men, while the depth of water along shore is such that the transports necessary to convey them to any designated point can lie at anchor, and at a signal come to the wharf at any state of tide, and receive the troops on board.

Some two hundred sappers and miners, under the command of Captain P. Okell, are occupied in clearing the ground of stones, stumps, weeds and rubbish, and have made satisfactory progress in the work. A house and barn are being repaired, the former being intended for reading room, post office, and offices, and the latter for the accommodation of cavalry horses. The old fences and hedgerows on the whole tract are to be removed, and a four-feet ditch is to be dug all round the boundaries, and the bank to be mounted with artillery, so as to make the camp thoroughly intrenched and fortified. The natural slope of the ground from the railroad to the water's edge is to the southeast. Towards the railroad a thick belt of timber breaks the force of the north-easterly winds, and from this eminence, where the marquee of the commandant is to be pitched, the whole camp will be in full view, its snowy streets stretching in regular lines to the blue waters of the distant bay. When the camp is thoroughly established, the view from this point, when 10,000 men are in line at once, for review, will be really splendid. The owners of 850 acres have generously offered their land without any charge, and a handsome, commodious villa has been placed at the disposal of Colonel Williamson, U.S.A., the commandant of the camp, for his headquarters, without any expense to the government.

It is determined to call it Camp Scott, in honor of the Lieutenant-general of our army. At the time of writing, there were about 2,000 troops encamped there, and after that, 200 to 400 will arrive each day, until the corps of reserve is full. It is the intention of the government to push forward the country regiments as fast as possible, and concentrate them at Camp Scott. A fleet of transports will lie off shore, and be in readiness to take an army to sea at a few hours' notice, whenever it may be necessary to re-inforce the army, or make a demonstration on the coast.

The arrangements for cooking will be on the most ample style, so as to be ready for any emergency; but it is intended to make each soldier cook his own rations, after the manner of the French army. Every other practical improvement introduced into the French service will be adopted, and no means will be spared to render our army as effective and self-reliant as possible. The *tente d'abri*, among other things, will be adopted. They consist of a strip of cotton cloth, 2½ feet wide and 6 feet long, smeared with caoutchouc to make them waterproof. Each man carries one of these strips and part of the pins on which they are to be stretched, and, on reaching camp ground, these pieces are attached in pairs by clasps, and the whole shelter for two men is put up in a few minutes.

The Attitude of Missouri.

Public attention has been directed with great interest to the probable attitude of this State. Governor Jackson declined to respond to the call of the government for troops to uphold the majesty of the law, and at once convened the Legislature in extraordinary session. A militia bill was passed that completely swallowed up the liberties of the people, and made the Governor a sort of military dictator. In his message he gave utterance to the idea that Missouri, owing to her geographical position and peculiar institutions, was in sympathy with the seceded States, knowing all the while that the State of Missouri was surrounded on three sides by the free States of Illinois, Iowa and Kansas, and on the south by Arkansas, with which his State had very little to do, and that between two extremes the only safe one was to be found in the Union and under the Constitution of the United States.

Three weeks' experience under secession would have sunk the State of Missouri in a slough of trouble compared with which the value of her slave property would be but a drop in the bucket; besides, whatever else is to come out of this war, the government would at all hazards hold Missouri in spite of opposition as an absolute duty to her dependencies on the west, which extend to the Pacific. Secession, under such circumstances, was evidently a suicidal policy, and, although at heart an enemy of the Federal government, Governor Jackson has settled down to the conviction that true policy required that he should keep quiet. The government of the United States has an army of 10,000 troops in St. Louis, therefore resistance to its authority is useless. General Price, commander of the State militia had an interview with General Harney, when a plan was agreed upon for the maintenance of peace and the avoidance of future conflicts between the Federal and State governments. They mutually declare a common object, that of restoring peace and good order to the people of the State, subordination to the laws of the General and State governments, and unite in recommending all persons to respect each other's rights throughout the State, and make no attempt to exercise unauthorized powers, as it is the determination of the proper authoritics to suppress all unlawful proceedings, which can only disturb the public peace. General Price pledged the whole power of the State officers to maintain order among the people of the State, and General Harney declares that this object being assured, he can have no occasion, as he has no wish, to make military movements which might otherwise create excitement and jealousies, which he most earnestly desired to avoid. They therefore enjoin upon the people to attend to their civil business, and express the hope that the elements which have threatened so seriously to disturb the public peace may soon subside, and be remembered only to be deplored.

It is to be hoped that this arrangement is sincerely made on the part of the State government, but it becomes General Harney to keep the most vigilant watch over all matters there, and insist unconditionally that loyal citizens shall not be driven out of the State, as has frequently been done.

The State troops at Jefferson City, numbering about 4,000 men, were ordered to disband, by General Price. At first they refused to obey, but it is believed that they will quietly disperse and return to their homes.

CARE OF STOVES AND PIPES.—Those who have taken down their stoves and pipes, should take care that they are placed in dry situations where they will not be exposed to dampness, otherwise they may be more injured by rust than by constant use during winter. By covering stoves with a thin coating of warm linseed oil, however, rubbed on with a woolen cloth they may be set in cellars without injury. Those who have not dry places to store their stoves and pipes, we recommend to use the linseed oil for the prevention of rust.

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Steel Cannons---Composite Guns.

On page 48 of our present volume we presented an illustration of a breech-loading steel cannon, made for the Russian government by Mr. Clay, of the Mersey Steel Works, Liverpool, England. The material of which it was made is known by the name of "puddled steel." It has been proposed to manufacture light rifled field pieces of this material for our army; and as "puddled steel" of a superior quality is made at the works of Messrs. Corning & Winslow, near Troy, N. Y., we are not required to send to England for a supply. It is four times stronger than cast iron, and it is capable of being both cast and hammered, so as to give it great crushing and tensile strength. It seems to us to be the best material that can be employed for making strong light cannon.

L. G. Sturdevant, of Talledega, proposes through the *Watch Tower*, the following method of constructing built-up cannon. Make first the interior cylinder of wrought iron, then coil iron wire around it until it is sufficiently strengthened. After which immerse the gun in a bath of molten brass to braze the coils together. Excepting the method proposed of brazing the coils, this system is similar to that of Captain Blakely's, described on page 341 of our present volume. Unless the surface of iron is perfectly free from oxyd, brass solder will not adhere to it. It would be very difficult to carry out this system into practice although it possesses novelty and ingenuity.

New Blue Color.

In a late number of *Comptes Rendus* a new color, called Paris Blue, is described. It states that 9 grammes of the bichloride of tin and 16 grammes of aniline, heated for 30 hours in a sealed tube at 180°, yield a very bright and pure blue color, which requires only to be treated with water to dye animal fibers beautiful bright tints. This blue resists acids; is deepened in tone with feeble alkalies, but becomes a purple with concentrated alkalies. This is a most important discovery, and is another addition to the remarkable series of rich colors derived from the products of coal tar. We would not be much surprised if all the colors and shades of colors—reds, blues, yellows, drabs, &c.—were yet to be produced on textile fabrics by the products obtained from our oil wells and coal mines. This new blue dye is also called azuline, and is now manufactured and sold in Paris and London in the same manner as Magenta coloring matter.

Cotton in England.

The Manchester *Examiner*, of the 11th of May, has the following:—

The question, "Where is the cotton to come from to keep the mills at work?" is now seriously engaging the attention of the manufacturers and operatives of North Lancashire; and a petition to Parliament is now lying at the mills and manufactories in Preston and other towns for signature only by the employer and the male portion of their hands. Meetings are also to be called to further the object of the petition, which says: "Your petitioners are greatly alarmed at the prospect of a serious diminution in the future supply of cotton in this country, in consequence of the civil war now raging between the Northern and Southern States of America. That your petitioners therefore believe it to be the duty of your honorable House, in this great emergency, at once to adopt the most prompt and effective measures for rendering India capable of furnishing an ample supply of improved cotton, your petitioners believing that India possesses the capability of meeting the requirements of this country, not only as a source for the supply of cotton, but also as affording a market for the products of their industry. Your petitioners, therefore, pray your honorable House to adopt such measures as will contribute to the development of the agricultural and commercial resources of India, so as to enable that country to compete, on equal terms, with the United States of America, especially in the production of cotton."

A Great Steamer.—Messrs. R. Napier & Sons, of Glasgow, are now building the steamer *Scotia*, which is intended to be a consort for the *Persia*, and will, when finished, be the largest merchant steamship, next to the *Great Eastern*, in the world. Her length is 396 feet; breadth of beam, 47½ feet; depth, 33½ feet; tuns burden, 4,050. The engine will be nominally 883 horsepower, but actually a great deal more. Her hull is of iron like the *Persia*, which vessel she will exceed in capacity by 500 tuns.

Rodman's Mammoth Cannon Mounted.—The 15-inch gun, of which we gave an illustration on page 305 of this volume, has been mounted at Fortress Monroe ready for service, and a number of shell, weighing 315 lbs. each, have been cast at Pittsburgh and forwarded for its use.

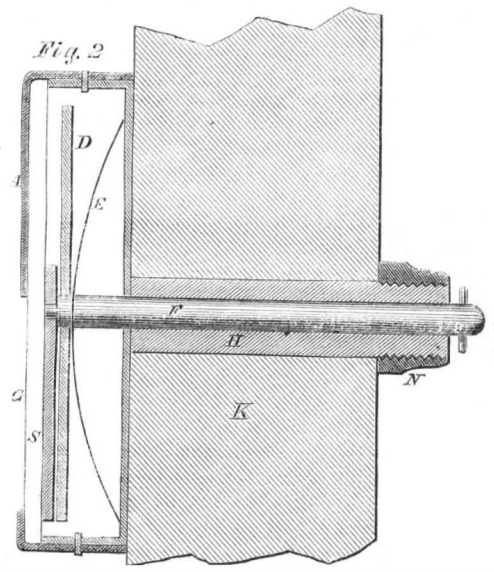
AMES'S PATENT INDEX DOOR-PLATE.

The accompanying engravings represent an article which every professional and business man, as well as every occupant of a house or room has often felt the need of having on his door. It is appropriately denominated by the inventor an "Index Door-Plate," which is described as follows:—

Fig. 1 is a front view, and Fig. 2 is a section through the plate and door, and fully explains the nature of the invention. A is the frame, of any suitable metal or material, on which the name is engraved, etched or stamped. G is a plate of glass; S, the removable plate for writing upon, of slate, porcelain or ivory; D, a circular card or dial attached to spindle, F, which passes through the door, K, and E is a spring for forcing the end of the spindle, F, into a

Fig. 1

Fig. 2



hole in the slate, so that the latter cannot be removed outside of the door without first withdrawing the spindle a little from the inside. N is a nut screwed to the end of the hollow shank H, by means of which the plate is confined to the door. For residences, if dasired, the dial may be omitted, the spring and spindle only being retained for confining the slate. Or a dial only, without a slate, may be employed if required. Thus if an individual, on leaving his office, studio, place of business, room, or house, desires to have it known at what time he will return, he has only to turn, by means of spindle, F, the dial, D, so that the hour required will be seen through a hole in the slate, as shown in Fig 1, the words "In at," being marked on the frame. Or if a person wishes to inform his callers where he has gone, where he may be found, or to leave, for any length of time, a notice or message of any kind, he can write it on the slate, S, and as the slate is protected by glass, G, and cannot be withdrawn by any one outside of the door, the writing can neither be altered, defaced, or taken away. The utility and convenience of the index door-plate is obvious to any one.

The patent was granted July 31, 1860; and for the purchase of rights, or further information address N. Ames & E. M. Montague, 17 State street, Boston, Mass.; or Harvey Brown, 21 Nassau street, New York city.

Americans in England.

Loyal Americans resident in England are making important donations to our government at the present time. A number of gentlemen in London, have notified the Secretary of War that they are about to ship three batteries of Armstrong rifled cannon—six, twelve and twenty-four pounders—with all equipments complete, of which they beg the acceptance of government. This princely gift could not have cost the donors less than $200,000. Other Americans, living in Manchester, have forwarded a battery of Whitworth guns—twelve-pounders—each of which bears the following inscription:—

"From loyal Americans in Europe to the United States government, 1861."

A large commercial house in this city have also offered to furnish, at their own expense, a battery of four rifled cannon—six, twelve, twenty-four and forty-two pounders.—*New York Tribune.*

Tenacitv of Metals.

Guyton Morveau has carefully determined the weight which can be supported by wires of a uniform diameter of 0.787 of an English line without fracture.

Metals.	Pounds.
Iron	549.250
Copper	302.278
Platinum	274.320
Silver	187.137
Gold	150.753
Zinc	109.540
Tin	34.630
Lead	27.621

Galvanizing Iron.—Sheet iron, iron castings, and other objects in iron, chains, nails, &c., are first cleansed in an acid bath, the water of which is so rendered by the addition of sulphuric and muriatic acids. They are then put into an alkaline bath, the effect being produced by the addition of a little soda to the water. After this they are taken, one at a time, and scoured with sand, emery, and water, using a piece of cork or cocoa-nut husk as a brush, and again thrown into a bath of very weak acid and water. Pure zinc when melted is covered at the time of the operation with a thick layer of muriate of ammonia (sal ammoniac) in an iron boiler or open vessel. The iron goods to be galvanized are now to be dipped into the fluid zinc, slowly raising them from the metal, so that the superfluous zinc may drain off. They are then thrown into cold water, on removal from which they are wiped dry, and the operation is finished. Thick, heavy pieces of iron require to be heated before dipping into the zinc, in order to avoid cooling it below the degree of fluidity.—*Septimus Piesse.*

Condensing Engines for Gunboats.—Several, if not all, of the gunboats built hurriedly for the British navy during the Crimean war, were fitted with high pressure engines. It seems that in every instance these engines were failures, being very liable to get out of order, thus involving great expenses for frequent repairs. This has led to the conversion of some of these engines from high pressure to condensing, and in every case, we believe, with satisfaction. A saving both of fuel and wear of machinery has been effected by the change.

Science Aiding the Union.—The government has arranged to use the Calcium light at Fortress Monroe, and the apparatus will be set up on the parapets in a few days. One of the reflectors of this light, which was once placed on the Latting Observatory, in New York, cast a distinct shadow at Tarrytown, thirty miles distant. By the aid of this light the garrison at Fortress Monroe will be able to detect any vessels that may attempt to pass the fortress at night, and give its artillery a distinct object on which to be effective no matter how great the surrounding darkness.

A small iron steamer of 73 tuns burden, the plates of which were only one-eighth of an inch in thickness, was fired at in 1841 with Paixhan 10-inch guns, having 12-pound charges of powder, at 450 yards distance. Although 40 of the shot went through the hull of this small, thin-sided vessel, yet she was not sunk, owing to her being divided into several water-tight compartments.

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White Metal and Plated Ware.

Our cotemporary, the London *Ironmonger*, contains an interesting article on this subject, being a description of the operations conducted at the celebrated works of John Yates & Sons, Birmingham. We condense the main features of it for our columns.

Copper, zinc and nickel, combined, in different proportions form an important series of alloys, known by the names of German silver, Albata, Argentine, Virginian plate, &c., &c. These alloys are generally hard, and white in proportion to the amount of nickel which they contain. They are employed for making drawing instruments, spoons, tea pots, &c.

Common German silver is composed of 8 parts copper, 3 of zinc, and 2 of nickel. The best quality of German silver is formed of 8 parts copper, 6 of nickel, and 5 of zinc.

Albata is composed of 8 parts copper, 4 of nickel, and 3 of zinc; argentine, 8 parts copper, 3 of zinc, and 3 of nickel. These two are most commonly used for the imitation of silver articles. Virginian plate contains two parts more of nickel than albata, and is therefore superior to it.

The processes of making the alloys, working them into articles, and then plating them, are as follows:—

The foreman gives out to the casters the proper quantities of the copper, zinc and nickel; a proportion of scrap metal is added, and the whole then melted in furnaces in pots of Stourbridge fireclay. When the metallic mixture is in proper flow, the crucible is grasped between the jaws of a pair of tongs, lifted out of the furnace, and, after stirring and skimming, cast into ingots, weighing from eighteen pounds upward.

The ingots are heated to a bright red in annealing furnaces, then allowed to cool, and when cold passed through iron rollers. The action of the rollers reduces them between Nos. 3 and 20, Birmingham wire gage (0.259 and 0.035 of an inch); as a general rule, however, at least in this establishment, the strongest metal used is No. 7 = 0.180 of an inch thick. When this part of the process is completed the strips are re-annealed, then clipt by a machine, cut out in disks, or other shapes, or slit up into strips of greater or less width, for spoons and forks.

The strips intended to be made into spoons or forks are again annealed, and then once more submitted to the action of the rollers at the ends, leaving the central part untouched. This operation has for its object to leave the central part thicker and stronger than the ends, and to widen the latter. The strips so prepared are now taken to the press shop, where the exact shape of the blank is cut out by fly presses. The prongs of the forks are pierced by a similar process. The cut spoon or fork, after being once more annealed, is then submitted to the action of the stamping machine, to receive the impression of the pattern. This is effected by several distinct operations with different dies. The articles are afterward examined and filed down so as to remove all the ragged edges, if they have any. Many articles, especially those which are quite thin, are spun in a lathe into the proper shape.

Beads and moldings are also generally formed upon the edges of vessels, &c., not merely for the purpose of ornamenting them, but also to give additional strength and stiffness. Such beads and moldings are now mostly produced by the action of rollers, the lower one with the beading and an upper one with the groove corresponding. When designed to be electro-plated with silver, the articles are boiled in solution of potash in water, to free them from grease; they are then quickly dipped in red nitrous acid, to remove any oxyd that may have formed on the surface, and after this twice washed in different tanks of water, to remove every trace of the acid. After carefully weighing them, they are suspended from a number of copper wires, and dipped into solution of quicksilver in cyanide of potassium, then again twice washed in different tanks of water, when they are ready for being plated.

The electro-plating bath consists of two distinct parts, viz., the voltaic apparatus, from which the electric current is obtained, and the vat in which the silvering or gilding is brought about. According to the quantity of electricity to be generated, and the intensity of the current required, the battery consists of one, two, three, or more cells. The vats, or plating vessels, are generally from four to seven feet long, by three feet broad; the larger size holding from 200 to 250 gallons of liquid—solution of cyanide of potassium in water is used. In large establishments, the cyanide is made on the premises, by fusing prussiate of potash (eight parts) with salt of tartar (three parts), in an iron pot. The fused mass is gradually transferred, with a ladle, to a large, shallow, brass basin standing in another basin containing a little water, to accelerate the cooling of the fused cyanide. Extreme caution must be observed in this to guard against the least drop of water finding its way into the brass basin, as the contact of the hot cyanide with however so small a quantity of water is sure to give rise to dangerous explosions.

Plates of silver are placed at intervals in the vats, corresponding in size to the surface of the articles to be plated, and facing them on both sides. Two brass rods are laid lengthwise over the vat, one on each side. These serve to support the copper wires by which the articles to be coated are suspended; the zinc pole of the battery is connected with them in the usual way, the copper pole being connected with the metallic sheets in the solution by means of a copper slip. As soon as the silver plates and the articles to be coated are both immersed in the solution, the voltaic current is completed.

When the operator has reason to believe that nearly a sufficient amount of silver has been deposited on the article, he removes this rod from the solution, and weighs the article, to ascertain whether the process is completed, or how much longer it will take to complete it. Any thickness of silver may, of course, be given to an article, by continuing the operation sufficiently long, but from three to six hours may suffice to give a proper coating of silver; 1½ ounces of silver to the square foot of surface is considered to form an excellent plate. The process of gilding is nearly the same as that of silvering, plates of gold being of course suspended in the cyanide of potassium solution, insted of silver plates. The old zinc plates are broken up, to get back the quicksilver with which they were coated. The last finish is given to the article by the operations of polishing and burnishing.

Articles of albata or Virginian plate, which it is not intended to electro-plate, are polished on buff wheels. Sheffield lime, sifted as fine as possible, is used for the finishing.

Electro-plated articles are first polished on revolving brushes or lathes, with rottenstone; then by hand with a buff stick (a strip of leather glued on wood), rouge being generally used in this second operation, instead of rottenstone. The finish is given with the naked hand, the finest rouge being used for the purpose.

Tea pots, candlesticks, and articles with fluted, chased and ornamented surfaces, are also burnished. The burnisher is a piece of very highly polished hardened steel (sometimes also of bloodstone, flint or agate), fitted up with a handle, which, when judiciously applied to the smooth surfaces of metals, imparts to them, by friction, a very high polish. The articles submitted to the action of the burnisher must previously be carefully smoothed, and all file marks or scratches removed from the surface. The burnishing is also done by women and girls, who generally possess a numerous set of burnishing tools of their own, which constitute their stock in trade, and, by rendering them in some measure independent of the manufacturer, enables them to command very fair wages.

After polishing, the articles are wiped with wash leather and wrapped in paper.

SHINPLASTERS.—The people of Savannah, owing to the scarcity of small change, have adopted twenty-five cent bills, issued by the Mechanics' Saving and Loan Association. They are made payable in current bank bills. The system of shinplasters is becoming very general in the seceded States, owing to the scarcity of money. Governor Ellis, of North Carolina, declared in a recent official message that gold and silver were not to be had in that State. Farmers are obliged to take these worthless shinplasters in exchange for their produce. Secession, however, is so excellent a remedy to them, for all their past sufferings under the Federal government, that they feel willing to part with their corn, beef, and bacon, for anything that will promote secession, and the peculiar blessings that follow in its train.

Casting and Gaging Bullets.

There is some little art in casting bullets properly, even in holding the mold at a proper angle to the lip of the ladle. In the system of running them into brass or gun-metal molds the lead should not be overheated, and yet, if not sufficiently hot, the ball will be irregular and full of cavities. There is a particular temperature, only to be ascertained after a little experience, at which the lead flows freely. It is well, when casting a quantity, to have a ladle containing ten or fourteen pounds kept at this heat, using a much smaller one to fill the molds, which should be provided with a long jet or channel for the lead to run through, and the molds should invariably be made to fill from the bottom. When a number of bullets have been cast, they should each be successively swedged in a steel die, so as to compress the metal and render each bullet perfectly solid and homogeneous. The least defect in a bullet fired from a smooth bore fire-arm causes great deviation in its flight. Rifling remedies this defect in a great measure, but not perfectly. For accurate shooting, as much depends upon the bullet as upon the fire-arm.

Temperance among Soldiers.

Our article upon this subject, on page 310, has been copied, with credit, by several of our cotemporaries. This is a question of great importance to the commanders of armies. It is not bulldog courage in soldiers which makes them efficient in war, but moral courage, intelligence and bodily capacity. Mere animal courage is a cheap commodity. The British legion in Garibaldi's army, in Naples, exhibited the most reckless daring, but it became completely demoralized on account of wine drunkenness. Good behavior is the first essential quality of soldiers, and unless they are temperate they will not be well behaved. Dissipated men are never reliable, and they cannot endure the fatigue like sober men. Drunkenness in an army can be prevented by the commanders; they can prohibit the sale and use of whisky in camps, and it is their duty to do so. Those parents whose sons have gone forth to defend the liberties and laws of their country dread the demoralizing influence of camp life upon them more than the weapons of the enemy, and intemperance is the polluted fountain of demoralization in most armies.

Drinking and Head Protection in Warm Weather.

On page 325 of our present volume some very useful advice was given to prevent sunstroke, and avoid undue indulgence in drinking water during hot weather. A letter to us from a correspondent—A. C. Titus—corroborates the correctness of the advice therein given. He states that he has used green leaves in his hat during warm weather for several years, and has found the practice very beneficial. To those who have a strong desire to drink great quantities of water in summer he gives the following advice:—"Take the twig of a birch, elm or other tree having a pleasant taste, and cut it into several pieces about half an inch in length each. Keep one of these in the mouth while traveling or working in the sun for about an hour, throw it away and supply its place with another, and thus continue during the warmest hours of the day. By following this advice, a person will feel no more desire to drink in warm than cool weather."

French Muskets.

A letter from Toulon, France, says:—

The civil war which seems on the point of breaking out between the disunited States of America is about to open for the French arsenals a market for exportation which certainly was not foreseen. It is stated that American agents have come to France to purchase arms and military equipments, which the storehouses of the State will be only too glad to get rid of.

It seems that our distinguished fellow citizen, Geo. Law, is not the only one who has been anxious to sell muskets. Such arms as the French are anxious to get rid of will not exactly suit the military tastes of our brave soldiers. They would prefer not to commit suicide. A report says that Law's old muskets, which have gone the rounds since the Hungarian rebellion, have at last fetched up in Montgomery, and met the approbation of Jeff. Davis. Nine out of every twelve kicked the gunner over on the first fire.

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Correspondence

Corrugated Plates for Ships.

MESSRS. EDITORS :—Since reading some particulars about steel-clad ships in the SCIENTIFIC AMERICAN, it has occurred to me that ships could be rendered shot-proof by using one half the thickness of steel with which the French and English ships are clad, in the following manner, viz., by corrugating or fluting the outside of the steel, or giving it an undulating surface with elevations and depressions like an old-fashioned wooden wash-board. The steel could easily be made so by heating and being crimped by a steam hammer. The philosophy of this arrangement would be simply to destroy the effect of the ball by giving it a lateral push or glancing the ball. I do believe that not one ball in ten would strike directly in the trough. Place them so as to run lengthwise on the ship near the water, so as not to prevent the speed of the ship, and have the water-line in a perpendicular position.

For example, if a person is falling from the roof of a house, give him a push at right angles with the perpendicular line of descent, and you break the force of the fall. This fact is well known to you, and probably to many. All I am after, then, is to push the ball sidewise. I should like to have the SCIENTIFIC AMERICAN talk a little on the subject. The idea may be old to you. J. C. STODDARD.

Worcester, Mass., May 16, 1861.

[As our correspondent supposes, the idea is not new. It has been proposed by Commander Dahlgren and somewhat extensively discussed, but the subject is by no means exhausted. On the contrary, it forms one of the fairest fields for invention and experiment that is now open.—EDS.

American-made Fire-brick.

MESSRS. EDITORS :—Reading in your issue of the 11th inst. an article on "Fire-clay Manufactures," brought to my mind that, in January last, I saw a notice in your paper of a patent issued in this country in the name of A. L. Boisson, of Lyons, France (obtained through your Agency), for an improvement in the preparation of the clay and the sand, for making a very superior quality of fire-brick, and also for a new plan of a kiln for burning all kinds of fire-clay articles. Such is the perfection of the kiln that it will save from 40 to 50 per cent in the cost of fuel.

Both of the above improvements were put into practice, last winter, at the works of Messrs. Palmer, Newton & Co., fire-brick manufacturers, Albany, N. Y., and so satisfactory were the results of the experiments that the firm purchased a right for the city of Albany.

Some of the bricks were built in the fire bridge (alternately with others) of a puddling furnace. After the furnace had been run the usual length of time, and had stopped for repair, the ordinary kind of fire-bricks were melted down, while the patent bricks were only colored, and retained their full original shape; and it was remarked by the workmen that had the fire bridge been built entirely of the patent bricks it would have lasted at least thrice as long as usual.

These bricks will be invaluable in gas works now that clay retorts are coming into general use, and as clay retorts will last from two and a half to three years without rebuilding, the furnaces must be made to endure that long. These bricks are invaluable on that account, and will supply the requirements. Gas engineers and owners of puddling furnaces will no doubt appreciate their value. S.

Albany, N. Y., May 15, 1861.

Patriotic Contributions.

Since our publication of the patriotic contributions to the support of the government, we have received several communications informing us of omissions. For instance, A. Homer Trego, of Lambertville, N. J., says that that town contains about 500 voters, and they have 160 volunteers now at the seat of war. All the officers and some of the privates have been presented with revolvers. All were furnished with a full supply of under-clothing, rubber blankets, vestments, &c. About $100 *per month* is subscribed for the support of the families that are left. Two other companies are organized and under drill, besides the lads from 16 to 18, numbering about 30, who are under good drill. The following letters, being short, we give as a fair sample of the lot :—

MESSRS. EDITORS.—In the SCIENTIFIC AMERICAN of May 25, 1861, on page 333, you have published a list of "Patriotic Contributions," &c. In that list are some mistakes which, for history's sake, I hope you will correct.

You say—"New Jersey (State) $1,000,000." It should be $2,000,000, as per resolution of extra session of the Legislature just concluded.

Again—"Burlington, Vt., $3,000." It should be $13,000, as, to my certain knowledge, one large manufacturing company there—the Messrs. Harding—gave $10,000.

Then, again, an *omission*. This city has voted $10,000, and obtained leave of the Legislature to issue bonds to that amount. Rahway, Elizabeth, and other towns also have voted large sums. A CONSTANT READER.

Trenton, N. J., May 16, 1861.

MESSRS. EDITORS.—I noticed in the list of "Patriotic Contributions" published in your paper, that Malden, Mass., has only contributed $2,000. That is a mistake; a company has been formed and $4,500 have been raised to equip them. The town has also voted $10,000 for the support of the families of those who enlist, and if more is wanted they will raise more. I wish the town done justice, and so I pen you this note. If necessary, Malden can raise a regiment and put them into the field in a few days. I, for one, should my country need me, will go and stand by the "Stars and Stripes," as long as I live. M.

P. S. · Malden furnished men for the Revolutionary War, and *she can furnish men for this war.*

LETTERS FROM THE SOUTH.

PETERSBURG, Va., May 6, 1861.

MESSRS. EDITORS:—Yours of the 27th ult., covering $25, together with the Letters Patent of my Self-acting Railroad, was duly received, for which I must say I am obliged to you.

You say we of the Middle States are beside ourselves. For what? For contending for our constitutional rights, and quitting your corrupt, rotten and rascally government, governed by a mean, vile abolitionist, who tramples on the constitution as he does the dirt he walks upon. Yet you say you are all for the "Stars and Stripes." Well, we of the South are just as unanimous against the "Stars and Stripes" as you abolitionists are for them, and we never intend to live under your "Stars and Stripes" again. You never can conquer or subdue us. We will fight—every man, woman and child of us—as long as we live, and will teach our children, from generation to generation, to hate and fight a Yankee worse than hell and the devil. I tell you our negroes will fight you all nearly as unanimous as their masters; for they, too, know the meanets masters in the South are Yankees who have settled among us. You may think these statements not correct, but when your mean, low, mercenary soldiers invade the South you will then see what I have written you is true.

But the "Stars and Stripes" to a Yankee is every and all things. Yes, so you say; but your real object is to keep us in the future as we have been in the past—make the South hewers of wood and drawers of water to the Yankee States. That is what you want and mean by the "Stars and Stripes." When did the South ever infringe upon the rights of the North? Never, in the whole history of the government. But the North never has treated the South as her equals. We must pay cod-fishing bounties. The coasting trade must he done in Yankee ships. We must pay high protective tariffs. What are we told as to the territories? "Ah, yes, you people of the South can't emigrate to them as equals with a Yankee." And, now, what is old Abe Lincoln doing? Why, violating the constitution with perfect impunity. The constitution expressly confides the war making to Congress, and it must be against a foreign State. And "Abe" says a State can't secede. To raise and support armies is the special prerogative of Congress. No preference shall be given by any regulation of commerce or revenue to the ports of one State over that of another—so says the constitution. Yet "old Abe" blockades the ports of nine States. The constitution requires the President to take care of the public property. What did "Abe?" what has he done at Harper's Ferry and at the Navy Yard in this State? But it is needless to say more. I could give a dozen plain violations of the constitution by that old usurper in the last two months. Yet your howling, hypocritical, fanatical set of blue-bellied abolitionists still proclaim for the "Stars and Stripes." Well, you can have the "Stars and Stripes;" WE NEVER WILL, CERTAIN. You never will subdue us; we will fight you from generation to generation, and, as Hannibal of old has done, will swear our children to hate and fight a Yankee as the greatest duty he can perform to his God and country. Yes, sir; we will teach it from the cradle to the grave as the most sacred duty in life.

Yes, I expect I am one of the earliest subscribers you had in western North Carolina to the SCIENTIFIC AMERICAN, which is more than 10 years ago, and have induced hundreds to subscribe for it, little thinking I was patronizing an abolitionist, and one who would seek the first *opportunity to imbrue his hands in my blood* Well, sir, as this is the case, *come on; let me know what regiment and company you are in and I will meet you in battle, and if I don't make one abolitionist bite the dust then you may have my head.* You will find when you invade our soil that you Yankees will have to fight perfect devils, for you have no idea what hatred universally pervades all and every one in the South. All ages, sex, colors and races hate a damned blue-bellied Yankee worse than hell. But you think you can whip us! Well, come on; you will get hell put to you all. With all the hate, scorn and contempt man can feel, I have for a Yankee abolitionist, J. C. WHITSON.

A short time previous to the receipt of this letter our friend Whitson congratulated us upon our success in his behalf, and even now thanks us for our fidelity in returning money due to him. We submit, however, that he is now acting in an underhand manner toward us in spite of our good offices to him. He wants to find out where we are going to fight, so that he may have a sly pop at us, perchance, from behind a tree or stone wall. A fair and open combatant will not conceal his own fighting ground under such circumstances. We have no murderous designs on our friend. We will state, however, that all our fighting will be done in the army of the constitution and the Union—a Union formed by Washington, Jefferson, Madison, and sustained by Jackson, Clay, Polk, Webster, and a host of other national men—dead and living. We want no better government, and if enemies of our peace and happiness—violent men North and South—have worked together to impair its integrity, they have found no sympathy from us. We are content to change our government and our institutions only in a legal and peaceful manner, and regard all violations and violators as enemies of social order and stable government.

LOOK OUT! LOOK OUT!!

FOR THE SCIENTIFIC AMERICAN, published in New York, and edited by Munn & Co. It is against the South, and Southern Mechanics and Artisans ought to drop the scurrilous sheet. Rebels, indeed! I wonder if rebels are not able to get patents as well as Black Republicans. Stop that paper, ye Southern men.

may3 3t* A SUBSCRIBER FOR TEN YEARS.

MESSRS. EDITORS.—The last number of your paper, bearing date May 4, 1861, was duly received, in which I find you to have gone *stark mad!* I also inclose you an advertisement for which I paid $1 (and that willingly, too), to show to those of the South the character of your paper. Your paper treats altogether on scientific subjects, and it was decidedly going out of your way to publish the articles contained in your last issue. I shall, if I am spared (although a rebel in your eyes), look out sharply for your paper amongst us, and do all I can to blast your character and reputation as unbiassed men. I also send you the rebel President's message, which I hope you will peruse (if not too insane), and come a little to your senses. That message covers the whole ground of argument, and is not to be refuted. The several States, in 1787, by each of their sovereign powers, dedicated themselves to each other and made the one Old United States, but, at the time, reserved their sovereignty to retake to themselves the control and management of their individual States provided their independent rights were infringed. Have not the Southern States, therefore, a right to do as they like with their own? Do you think you can make us remain and support your rotten government, after the bitter hate you have all shown us? No! never, if you beat us. Can you thus make us do what we do not want to do? Never!! If your free States have the power to pass their Personal Liberty Bills and Laws, we then have a right to leave such an unjust and overbearing set of men; but argument is futile in this war of fanaticism. Respectfully,

WM. S. ALDERSON.

Mobile, Ala., May 4, 1861.

P.S. You will therefore stop my paper from this time forth, for evermore. Amen.

COURTLAND, Ala., May 9, 1861.

MESSRS. EDITORS:—You will please stop my SCIENTIFIC AMERICAN. I want no communication in any shape with *abolitionists.* I will never patronize any one that will sustain Lincoln and his blood-thirsty, Heaven-daring crew. I, like many others, was strong for the Union until Lincoln made known his fiendish course by calling out 75,000 men. He is getting a military power at his control that will, before twelve months, make many quail and tremble that are now almost willing to bend the knee and wipe the dust off his boots. He'll give you a standing army, to the sorrow of many a Northern heart. With due respect, * *

Our correspondent having failed to give us his name, we are unable to stop his paper. If, however, he wishes us to cease only on account of our supposed *abolition* sentiments, we shall doubtless be able to continue our intercourse with him for some time to come. It is a matter of surprise to us that many Southern people cannot tolerate a supporter of the Federal government without denouncing him as an abolitionist. Knowing this charge to be *false*, not only with reference to ourselves, but also in reference to our people generally, we might be content to pay no attention to it; but the charge is persistently made to influence the whole population of the South against the North in a most unworthy manner, and deserves to be rebuked. Even a New Orleans paper pronounced General Butler an African, leaving out of view the fact that he was the Breckinridge candidate for Governor of Massachusetts at the last election, and that, while in Maryland, he offered to Governor Hicks the soldiers under his command to suppress servile insurrection. It is a bad cause that must rely upon such stuff to maintain it. Our friend seems to commiserate us on the prospect of our being subjected to a military power supported by a standing army. We apprehend that, at the worst, we shall be as free as himself in this respect. Let come what may, hereafter, the United States must maintain a standing army. This Southern revolution will render it absolutely necessary. The government must have more ready machinery to protect itself against danger by land and sea.

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Letter from a Southern Unionist.

MESSRS. EDITORS :—In your excellent and temperate political article in No. 19 of the present volume of the SCIENTIFIC AMERICAN, on the "Reason for Secession," permit me to say that you have (perhaps, however, without the knowledge of it) omitted the chief reason, or, at least, the supposed or imaginary one, viz.: that the consequence of Lincoln's election would be, from his well-known aversion to slavery, total ruin to the slave owner, and the final emancipation of all the Southern slaves, which, to Southern notions, would be equal to letting loose a host of wild beasts or savages among them. This is the main cause of the Southern hostility to the Federal government, and were the mass of the people satisfied that such would not be the case, many that are now in military ranks would be at home.

There are still, however, many here who take no part in the matter, and will not unless compelled—those who are not slave owners, and, from their present enormous prices, perhaps never will be able to own any; also those who are opposed to aristocracy, who, from their wealth, monopolize every negro and rich piece of land, leaving the poor man but a sorry chance to make a living. Many are also uninterested because they think the rich urge it on the humbler classes to do their fighting and help them to support the slave system while they themselves luxuriate in idleness at home. It is believed that if the matter had been left to the unbiassed votes of the people at large, there never would have been secession; the vote was by no means unanimous. Many that did vote were urged on to it to prevent the liberation of the slaves before alluded to, and here, though a Unionist, I would say, from an intimate acquaintance with the whole matter, and a residence both North and South, it would never do to set slaves totally free among the people here, if, indeed, that ever was the intention of the Lincoln administration. It is only by careful watching and the strictest laws that they can now be kept in order; and, to be candid, much of the labor required in this country can only be performed by the negroes. For instance, what white man can work in swamps or cultivate rice? however many would be glad of some change in the system.

In Southern eyes, the desertion of Fort Moultrie and allowing the secessionists to construct fortifications right under the guns of Fort Sumter, was and is looked upon as an evidence of the total weakness and want of courage in the Federal government, and the victories and advantages generally gained by the South is looked upon as an instance of special Divine favor and approbation of the Southern movement. However, the wicked prosper more for a time than the righteous. Let the Federal government be cautious; the attack on Washington is only a ruse to attract the Federal troops to one spot. Let the government make one good example, and show the South that Northerners are not the weak and bombastic cowards they are here taken to be—the fleet off Fort Sumter favoring this notion. All the remarks in Northern papers, yours among the rest, are here set down as fudge, and written for effect. S. C.

P. S.—For obvious reasons, I must withhold my name, but am a subscriber to your paper. I may add that the South implicitly believes that King Cotton will finally carry it triumphant through all difficulties.

Camden, S. C., May 17, 1861.

St. Louis Arsenal.

MESSRS. EDITORS :—I know you are disposed to admit nothing into the columns of your paper but facts, as near as you can get them, in relation to the unfortunate troubles which are now afflicting our common country.

In this connection, I would beg to call your attention to the letter copied into your paper a short time ago, in relation to the removal of arms from our arsenal. There are no material facts in the communication except the removal of the arms, peaceably and without the least anticipation of trouble from any quarter. The experiences of the last few days will show how perfectly ridiculous it was to anticipate trouble from that quarter, when the whole camp was taken possession of by the United States forces. If Captain Stokes experienced the anxiety he says he did, it shows him to be a very scary man. Having no motive in writing this except the dissemination of truth for your history,

I remain, yours, for the whole Union, R.C.

St. Louis, May 15, 1861.

STAIN FOR TWISTED GUN BARRELS.—The following is the usual recipe for staining twisted barrels :—Take of tincture of sesquichloride of iron half an ounce, corrosive sublimate one drachm, sulphate of copper half a drachm, nitric acid one drachm to one drachm and a half, spirit of wine six drachms, water eight ounces. Dissolve the corrosive sublimate in the spirit of wine, then add the solution to the other ingredients, and let the whole stand for a month or six weeks, when it will be fit for use. The barrels are first cleaned carefully with lime, and this being removed, the browning mixture is laid on with a sponge five or six times a day, till the color is dark enough for the fancy. Once or twice a day a scratch-brush is used to remove the rough oxyd and allow the acid to get a deeper bite. When it is considered that enough has been done, boiling water is poured over the barrels for several minutes, and, while hot, they are rubbed with flannels and finished with a leather and a little beeswax and turpentine.

Remarkable Locomotive Explosion.

The Chicago *Tribune* thus describes the recent explosion of a locomotive on the Michigan Southern Railroad :—

The train was due in this city at 8 P. M., and it consisted of two passenger cars and a baggage car drawn by the fine Manchester built engine, *Charles Butler*, No. 67. Conductor Curtis was in charge; George Nair, engineer. As the train was nearing Ainsworth station, the intersection with the Illinois Central Railroad, 11 miles from this city, the engineer sounded his whistle to break up, and the breaks were applied, when, just as the speed was checked, the boiler exploded with fearful violence, tearing away the "crown sheet" downward through the firebox.

The effects of the explosion were terrific. The heavy machine, weighing 23 tuns, by the downward and lifting force, leaped bodily from the track into the air, turned a summersult, and landed reversed and bottom side up a distance of 354 feet from where the accident took place.

This seems incredible, but is shown by actual measurement. The train was running at the time at about 15 miles an hour, but had been running at high speed. There were on the engine the engineer, Mr. Nair, his fireman, Charles Stelp, and the track foreman, named W. Anderson—the latter sitting on the cab seat. Mr. Nair was thrown into the air and to one side, landing near the fence senseless, but not dangerously though severely injured. None of his limbs were broken.

The other two men—Stelp and Anderson—were probably instantly killed, the former being frightfully scalded, his clothing being torn from his person. Both bodies were taken from the ruins of the tender and baggage car. No other person in the train was injured, though several were buried in the sudden shock and halt of the train. The track was torn up for a distance of several rods.

The track of the Pittsburgh, Fort Wayne and Chicago, at this point, runs for some distance closely parallel to the Michigan Southern track; and on the former, a passenger train due here at the same hour was approaching the city. The passengers in each were watching the other, when suddenly the persons on the Pittsburg train saw the engine leap into the air, with the crash and ruin that followed. The suddenness and appearance of the disaster is described by one of the passengers as to have produced, at first, the impression that, by some fiendish malice, the train was blown up by powder placed beneath the track.

Massachusetts Manufacturing Dividends.

We extract the following interesting business items for the Boston *Commercial Bulletin* of the 18th ult. :—

The Lowell Machine Shop has declared an annual dividend of eight per cent, payable 27th inst. Commenced in 1855—make cotton machinery, locomotives, &c.—capital of $600,000, all paid in—liabilities, March 21st, $223,686.00.

The James Steam Mills, Newburyport, have declared a semi-annual dividend of five per cent, payable 20th inst. Commenced in 1842—sheetings and shirtings—capital $250,000.

The Globe Steam Mills, Newburyport, has declared a semi-annnal dividend of three per cent, payable from 13th inst. Commenced in 1844—make jeans, flannels, printing cloths, &c.—capital, $200,000. At the annual meeting of the stockholders of the corporation, 13th inst., Mr. Alexander D. Brown was elected treasurer in the place of John Porter, Esq., who resigned after a service of 17 years. He leaves a good successor in Mr. Brown, who has been employed at the Bartlett and Globe Mills for 22 years.

The Bartlett Steam Mills, Newburyport, will hold their annual meeting next Monday, the 20th.

The Fibrilia Felting Company, organized under the general laws, have issued their legal notice, from which we condense the following :—This corporation is formed to carry on the business of manufacturing flax, hemp, jute, China grass, silk, wool, cotton, and like fibrous substances in the various forms of manufacture necessary for yarns, cloth and felt, as well as the bleaching and coloring the same. The capital stock is $10,000, which has been paid in and has been expended in the purchase of machinery, patent rights, &c., for carrying on the business. The par value of each share is $100, and the business is carried on in Winchester, Middlesex county. Stephen M. Allen is president, Geo. L. Fall is treasurer; and they, with S. P. White, are the directors.

The Suffolk Lead Works, South Boston, commenced in 1844—make sugar of lead, chemicals, &c. Their capital is $100,000 paid in, and their total liabilities on 30th ult. were $61,340.

New Gun Boats.

The United States Navy Department has invited proposals for building the machines of several screw gun boats. The engines of each are to be horizontal, with surface condensers, and of two vertical water tube boilers; the cylinder to be 30 inches in diameter, and the stroke of the pistons 18 inches; the two boilers to contain 91 square feet of grade surface, and 2,700 square feet of heating surface. No proposals will be considered except from the proprietors of engine building establishments. Screws are not well adapted for vessels of light draft when great speed is required, as the screw is most effective under a considerable head of water. We want gunboats of light draft, very fast and strong, so as to run down any craft of ordinary character. As paddle wheels, however, are not suited for war vessels, they being too much exposed, the best way to secure speed with light draft, when using a propeller, is to employ a screw of reduced diameter and moderate pitch, and give the shaft a proportional increased velocity to compensate for the reduced size of the screw.

THERE are 1,863 registered merchant steamers in Great Britain, of which 1,001 have iron hulls Of this number, 1,201 have paddle wheels, and 572 screws.

Improvement in James' Shot.

MESSRS. EDITORS :—In a discussion at the Polytechnic, reported on page 282 of the present volume of the SCIENTIFIC AMERICAN, is a suggestion of Capt. Bartlett's that General James' shot might be improved. Such improvement I propose to make by tinning or galvanizing the parts of the shot designed to receive the leaden bands, such bands to be cast on the shot while said shot is in a heated state, which will cause the lead to be finally united to the iron when cold. The heat of the shot should be sufficient to keep the metallic coating melted while the lead is being cast on. The mold should be made of iron, in two pieces, which must encompass the shot, leaving, of course, a place for paving in the metal. W. J. SANDERSON.

Syracuse, N. Y., April 29, 1861.

A New Alloy.

We take the two following paragraphs from the Paris correspondence of the *Photographic News* :—

Mr. Aichs, of Brussels, has introduced a new metallic alloy, which is much cheaper than red copper, and even lower in price than brass, while it can advantageously replace those metals in naval constructions and other branches of industry. It has more tenacity than copper or brass, and is less subject to oxydation. It possesses the great advantage of working as well cold as when heated; it may be forged without losing its cohesion; it melts readily, and can afterward be submitted to the operations of hammering, rolling and punching. In a state of homogeneous fusion, this alloy consists of 60 parts copper, 38.2 of zinc and 1.8 of iron.

THE THEORY OF MAKING STEEL.

The conversion of iron into steel has taken another step toward a satisfactory theory of cementation, through the labors and intelligent experiments of Captain Caron. The result of his last researches may be summed up as follows: 1. That in industrial metallurgy cementation is always produced by means of a cyanide, which is formed naturally in the cementation boxes, by the reciprocal action of carbon, nitrogen and the alkalies present. This is the reason why the presence of nitrogen is indispensable. 2. That, nevertheless, under certain circumstances, it is possible to cement without the presence of nitrogen; which proves, *en passant*, that steel is not, as some chemists have attempted to prove, a nitro-carbyd of iron. 3. That to cement it is necessary and sufficient that the agent of cementation be a volatile or gaseous compound, but indecomposible at the temperature employed; in this manner the carbon is brought to a state of combination in the very pores of the iron where this metal appropriates it in its nascent state. 4. That native carbonate of baryta, or carbonate of strontium, mixed with carbon is susceptible of becoming one of the most useful and economical agents of cementation, on account of its unalterability and its power. The question of effectual and economical cementation of iron would appear now to have attained a satisfactory solution. The above mixture, once formed, may be employed indefinitely; it will only require the addition of a small quantity of carbon occasionally, to supply the loss of such portions as may be accidentally consumed. The barium, after yielding up its carbon to the iron, becomes regenerated by the oxyd of carbon, always present at the same time with nitrogen, in the cementation boxes.

[On page 321 of the present volume of our journal, we questioned the theory that nitrogen is essential to the production of steel; and we said that "the common process of converting scrap iron into steel would lead us to conclude that nitrogen was not an element necessary to the manufacture of steel." The last number of the London *Mechanics' Magazine* (May 10th) received by us, contains a communication from Robert Mushet, a distinguished scientific and practical steel manufacturer, in which he confirms the views we have taken of this question. He asserts that the use of cyanogen compounds have been known in England, in the manufacture of steel, for 60 years, but no bad steel was ever improved by cyanogen or nitrogen compounds. He asserts that no nitrogen ever finds its way into the melting pots in which the best cast steel is fused, and he completely ignores the nitrogen theory in making steel.—ED.

PLANT CORN.—Our news from France makes it evident that the crops will be short in that country, and that we shall have a continuance of foreign demand for our breadstuffs. It is impossible to exaggerate the importance of this—it will enrich our farmers and keep specie in the country, thus strengthening us and enabling us to keep the government supplied with the means of carrying on the war. Let every farmer who loves his country, and who understands his own interest, plant as great a breadth as he possibly can. The news from France makes it evident that prices will be remunerating, and that the Old World will be ready to take all we can spare, and pay cash for it. The prospect is a good one for all farmers who have the foresight to take advantage of it. A soldier must eat, and the waste consequent upon military operations will cause a larger consumption per man than in time of peace.

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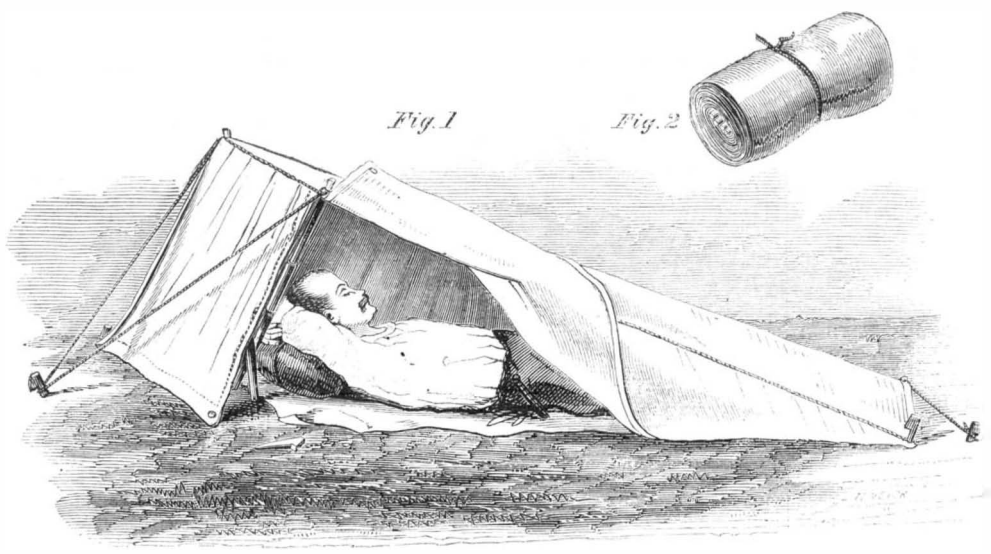
Improved Portable Tent.

Any man who has slept in the open air in a rainy night can appreciate the value of a tent that will keep him dry, and if such a tent can be made of so small bulk that it can be carried on a knapsack, and of less than three pounds in weight, probably every soldier would be willing to carry one for the sake of its shelter. The tent here illustrated was invented by E. C. Williams, of Jersey City, N. J., and is designed to be carried on the back of a soldier, for whose exclusive use it isappropriated.

Its length is 6 feet 4 inches; width at top, 24 inches; width at bottom, 2 feet 9 inches; hight at the head, 27 inches; hight at the foot, 10 inches; weight, all complete, 2 lbs. 6 oz. to 2 lbs. 8 oz. When rolled up, the size of the roll is $3\frac{3}{4}$ inches in diameter and 16 inches in length.

It can be carried either in or on the knapsack, and can be erected in less than one minute. It will shed rain perfectly, and severe storms will not blow it over.

The braces which support the head are made with joints in the manner of a fish rod, so as to be readily taken apart and rolled up inside of the canvas.



WILLIAMS' IMPROVED PORTABLE TENT.

Application for a patent for this light, compact and efficient shelter has been made through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the assignee, James Flanagan, No. 474 Broadway, New York.

Oddities of Invention.

A very high appreciation of that which is simply curious in art was universally entertained in former times. We, more practical than our ancestors, attach higher value to that which is really useful, and curious contrivances of mechanical skill are abandoned to conjurors and toy manufacturers. One or two samples of the kind of inventions which were of old particularly esteemed, may not be uninteresting; but, at the same time, it is necessary to premise that these descriptions, being taken from the accounts which have been bequeathed to us by those who knew little either of science or mechanics, it is not unlikely that some of the statements may be exaggerated, and undue importance have been given to things which would now scarcely excite interest.

Petrus Ramus tells us of a wooden eagle and an iron fly, made by Regiomortanus, a famous mathematician of Nuremberg. The eagle was made to spread its wings, fly in the air, and, meeting the Emperor Maximilian some distance from the city gates, salute him, crown him, or something of that sort, and follow him back to his palace. This mechanical eagle—our French neighbors employ a live eagle on similar occasions—is said to have excited great astonishment in all who have witnessed its flight, and a poet has described it :—

——— Mounting from his fist that framed her,
Flew far to meet the German emperor;
And having met him, with her nimble train
And pliant wings, turning about again,
Followed him close unto the castle gate
Of Nuremberg, where all their shows of state,
Streets hanged with arras, arches curious built;
Gray-headed Senate, and youths' gallantries,
Graced not so much as only this device.

The same poet describes the iron fly :—

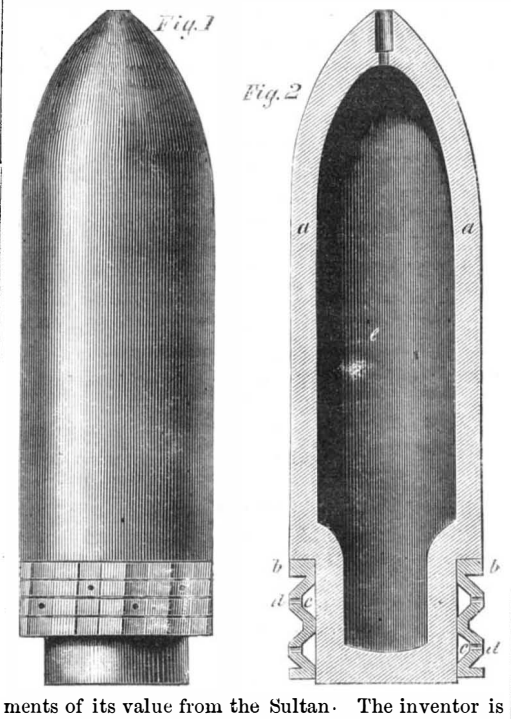
Once, as this artist, more with mirth than meat,
Feasted some friends whom he esteemed great,
Forth from his hands an iron fly flew out,
Which, having flown a perfect round-about,
With weary wings returned unto her master,
And as judicious, on his arm he placed her.
O, wit divine, that in the narrow womb
Of a small fly, could find sufficient room
For all these springs, wheels, counterpoises, chains,
Which stood instead of life, and blood, and veins.

In the twentieth year of Queen Elizabeth, Mark Scaliot, a blacksmith, made a lock, consisting of eleven pieces of iron, steel and brass, all of which, together with a pipe key to it, weighed but one grain of gold; he made also a chain of gold, consisting of forty-three links, whereunto, having fastened the lock and key before mentioned, he put the chain about a flea's neck, which drew them all with ease. This is, perhaps, the earliest specimen of fleas—artificially—industrious on record.

An old writer tells us that Janellus Turrianus, "a great master in the mathematics," amused the leisure of Charles V.—he who was frightened into a monastery by a comet—by exhibiting "miracles of study." Sometimes he sent wooden sparrows into the Emperor's dining room, which flew about there and returned; at other times, he caused little armed men to muster themselves upon the table, and artificially move according to the discipline of war, "which was done so beyond example that the superior of the religious house of St. Jerome, being ignorant of the mysteries of art, suspected him of witchcraft."

COCHRAN'S CORRUGATED RING OR CUP PROJECTILE.

We here present an illustration of another packing ring for elongated shot, so entirely novel in its character as to attract the attention of all who take an interest in this department of science. It was invented by J. W. Cochran, Esq., the gentleman who took a revolving cannon to Turkey some years ago, and received a gold medal and more substantial acknowledgments of its value from the Sultan. The inventor is a man possessing great talent as an inventor, and one who has, perhaps, given as much attention to rifled ordnance as any person in the country.



The ring or cup here illustrated is made of any malleable metal, though experiments have demonstrated the superiority of copper for the purpose. It is cast as nearly perfect as may be, and then finished by being struck up in a mold with an expanding die.

Fig. 1 is a longitudinal central section of a shell, showing the corrugated ring before firing; and fig. 2 is a perspective view of the shell after being fired. The shell, *a a*, is turned down or cast smaller at the rear end, so as to pass through the ring, which i made externally of the same size as the body of the shell. As the powder is fired, the expanding gases, pressing against the lower or rear end of the ring, fold the corrugations together, and force out the exterior portion into the riflings, completely filling them and preventing all windage. This action presses out the grease, *c c*, through the holes, *d d*, made in the metal for this purpose, and completely lubricates the bore of the gun.

Mr. Cochran contends that the expansion of the ring, owing to its corrugated construction, must necessarily be so perfectly equal in every direction that it will lift the rear end of the shot or shell exactly into the middle of the bore; and not only so, but that the powerful toggle-lever purchase, obtained by the closing together of the corrugations, will pry up the forward end of the shot also so that the axis of the shot will precisely coincide with the axis of the bore. He says that the weight of the shot is insignificant when opposed to the tremendous power exerted by the corrugations thus coming together under a pressure of 5 or 10 tuns to the square inch.

The advantages of this ring are thus stated by the inventor :

"The great advantages in this mode of closing the windage, and of course filling the rifle grooves to a rifled cannon, are obvious. 1st, The forcing forward or closing up the corrugations of the expanding rings, not only perfectly fills the bore of the piece and centers the shot, but firmly grips or attaches itself to the projectile, so that no part of it can leave it in its flight, which is a matter of the first importance. 2d, The inside recesses furnish a very safe and convenient place to deposit the lubricating material, and will always be sure to be forthcoming when the discharge takes place, to lubricate the rifle grooves. Grease should never be applied to the surface of the shot, as it will collect dirt and sand, and is liable to be destroyed by vermin when exposed. 3d, The ring occupies but a very little part of the body of the shot, and therefore leaves nearly the whole space for the bursting charge. As the end of the shot passes through the ring, say a quarter of an inch, which is of the same size as the body, the shot can be packed in boxes on the base end, with the point upwards in the usual way, without injury by jolting or jarring in transporting.

"Any kind of malleable metal may be used for the corrugated ring (wrought iron has been used successfully); soft copper is preferred. By being struck up in dies, the rings can be made very light and strong, and the copper is found to work well. Lead has not been found to answer well, particularly in heavy shot, where it is very likely to get bruised or pressed out of shape in handling and transporting, and will lead or fill up the rifle grooves, particularly in iron guns when rusty. It is so soft that sharp sand will imbed or get jambed into it, and, of course, cut out the lands of the rifle bore. Copper at first cost is quite as cheap as lead, only about one-fourth its weight being required. By the complete closing of the windage about three-fourths of the powder is saved—experiments having shown that one ounce of powder to the pound of shot is sufficient, while the United States service charge is one-quarter of a pound of powder to the pound of shot."

Mr. Cochran has been making numerous experiments with this shot, and he says that, with the same weight of shot and powder, he has made as accurate shooting, with as low an elevation and as great power of penetration, as has ever been made with any breech-loader, under the same conditions of weight and size of gun, weight of charge, &c.

Any further information will be given on application to the inventor, No. 160 Broadway, New York.

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VOL. IV. NO 23.....[NEW SERIES.]....*Seventeenth Year.*

NEW YORK, SATURDAY, JUNE 8, 1861.

WHO BEGAN THE WAR

A few of our readers at the South are blaming us for supporting the United States government in what they characterize "its unholy war upon the South." If we know our own hearts, we wish to do justice to all concerned, and we will simply ask those of our Southern readers who feel aggrieved because we support the government, "Who began the war?" This is an important question, and should not be answered except by reference to stubborn facts. We will state a few, which cannot be denied. During the administration of James Buchanan, the Secretary of War, John B. Floyd, of Virginia, began the work of depleting United States arsenals in the Northern States, and transferred from a single arsenal 114,000 muskets to Southern arsenals. We have this on the authority of a Richmond paper. These United States arsenals were seized by the State authorities, and the guns put into the hands of the State militia, in many instances while those States were unquestionably in the Union. Large sums of money were appropriated to arm those States—and for what purpose? Will any sane man deny that the object was to use them against the Federal government? If so, let the facts speak for themselves.

In reference to the forts, Joseph Holt, of Kentucky, Acting Secretary of War, in his letter to Mr. Hayne, of South Carolina, who came to demand the retrocession of Fort Sumter to that State, says on behalf of the Federal government, "We are equally opposed to the coercive policy practised by South Carolina, and, after reducing the pretensions of the Federal government to the lowest standard, we are constrained to hold that the United States have at least as much right to be left in the undisturbed occupation of the property which they lawfully hold, as South Carolina enjoys in the undisturbed occupation of that which she holds in contravention of the legal title vested in the Federal government."

We believe all will acknowledge that, so far as the legal title to that fort was concerned, it was vested in the Federal government. The next fact which brings us to the immediate point of war is found in the correspondence of Gen. Beauregard and Major Anderson. At 11 o'clock, p.m., April 11, the former addressed the latter, inquiring "the time at which you will evacuate Fort Sumter, and agree that in the meantime you will not use your guns against us unless ours shall be employed against you." Major Anderson replied at 2½ o'clock on the morning of April 12th, that "I will, if provided with the necessary means of transportation, evacuate Fort Sumter by noon on the 15th inst., should I not receive, prior to that time, controlling instructions from my government, or additional supplies, and that I will not in the meantime open my fire upon your forces, unless compelled to do so by some hostile act against this fort or the flag of my government." Who began the attack? Is it not a fact that General Beauregard opened fire on the batteries of Fort Sumter in two hours after the date of Major Anderson's reply? Who can deny this fact? Certainly no man in his senses. How was this attack received by the government at Montgomery? Mr. Davis was not able to answer the call of the multitude; but his Secretary of War, L. Pope Walker, used the following language:—"No man," he said, "could tell where the war this day commenced would end; but he would prophesy that the flag which now flaunts the breeze here, would float over the dome of the old Capitol at Washington before the first of May. Let them try Southern chivalry, and test the extent of Southern resources, and it might float eventually over Faneuil Hall itself."

Secretary Walker says the war was commenced that day, April 12th, and, of course, had reference to the attack on Fort Sumter. He furthermore says, and as a high officer at the head of the War Department, the intimation had a marked official significance, that he would prophesy the capture of Washington, for certainly no sane man could ever suppose that he expected to have the Confederate flag float over the Capitol at Washington without first driving out the Federal government, and this could not be done without carrying the war to that city. Furthermore, if it should ever float over Faneuil Hall, it could only be by the subjugation of the city of Boston, to say nothing of any other portion of the North. The Proclamation of the President of the United States was not issued until three days after the attack upon Fort Sumter, and yet in the face of such facts as these, our Southern friends say we are making unholy and wanton warfare upon them. We ask them in all candor, if it would not appear upon the page of history one of the most cowardly things in the world to see a free people tamely allowing their government to be driven from place and power without an effort to sustain it?

ARMSTRONG GUNS DENOUNCED—BREECH-LOADING CANNON.

In the London *Mechanics' Magazine* of April 26th, a brief report is published of a lecture lately delivered before the United Service Institution, by Commander Scott, R. N., in which he expressed the opinion that the Armstrong gun will not do for the navy. He corroborated the reports respecting the shot of this gun being defective by the lead bands stripping off. He had seen targets cut to ribbons, not in round holes, but by fragments of the lead from the bands. This occured in experiments where a screen, placed within 20 yards of the gun, had to be replaced several times. At Devonport he had seen a 100-pound shot fired from the Cambridge gunnery ship with an Armstrong gun, and the lead band went one way while the shot went another. He also stated that in China, the breech screws of the Armstrong guns could scarcely be moved after being out one night in the damp atmosphere. He also asserted that, for short distances, the old smooth bored guns were superior, as the initial velocity of the round shot was about double that of the Armstrong shot.

Commander Scott stated that he preferred plain iron shot in preference to that having lead bands. Nothing, he asserted, could prevent the stripping of the lead casing. He also asserted that, when conical shot was made very long, it was not so accurate as round shot. The long shot do not always fly point foremost, but frequently sideways. In experiments made at Shoeburyness, the target gave evidences of having been struck in this manner. In striking the straight sides of a ship, long conical shot were liable to be deflected at an angle and to glance upwards. It is of great importance, he stated, to obtain a light shell, as the strain upon the gun was in proportion to the inertia of the shot in imparting motion to it. Round shot has the advantage in a rifled cannon at short range. Commander Scott depreciated the use of built-up guns, such as those constructed of several parts, like the Armstrong and Blakely cannon.

The editor of the London *Mechanics' Magazine*, in a leader, refers to this lecture, and asserts that it confirms the position taken by that periodical against the Armstrong gun—that it was defective in construction and inferior to common bronze guns for the purposes of war. It asserts that the British people are being hoodwinked respecting the superiority of this gun, and that Sir William Armstrong has been patronized by government officials, to the great injury of other inventors who had superior guns.

It appears strange to us that artillery and naval officers, who have the most interest in the Armstrong gun, and who have used it, should not have come out and denounced it, if it is so defective as has been represented. They want the best guns which can be obtained, and not such as will be more destructive to themselves in battle than the enemy. If, then, the lead bands of the Armstrong shot are so liable to fly off and kill friends instead of foes, we would expect the officers of the army and navy who use them to protest against their employment. Thus far this has not been done, which would lead us to infer that the London *Mechanics' Magazine* may be mistaken; but certainly, we believe it has no interest but that of the public to subserve in the position which it has taken, and this gives us some confidence that its editor may be on the right side of the question.

As for the screws of the Armstrong guns being unmanageable, after being exposed one night in a damp atmosphere, this was a very poor argument advanced against them by Commander Scott; a little oil or grease on the screw can prevent all such troubles. And as for the lead bands of the conical shot coming off, this is no fault of the gun but the shot. We believe that lead bands may be cast upon conical iron shot in such a manner that they will not fly off. If we cast the iron base of a conical shot with three narrow deep grooves around it, instead of one broad thin groove, and cast the bands in these, no danger need be feared of their flying off. The bands will form in this case thick rings, and projections may be cast in the iron to hold them from slipping. Good breech-loading cannon and reliable solid shot would certainly be the most effective artillery.

EXPERIMENTS WITH CANNON AND SHOT.

On Saturday, the 18th ult., by special invitation, we witnessed experiments with a rifled cannon and the expanding shot of Messrs. Hotchkiss, illustrated on page 293 of the present volume of the SCIENTIFIC AMERICAN; also some trials with the breech-loading cannon of Mr. G. W. Bishop, of Brooklyn, the foreign patents for which were secured through this office. The place for conducting the trials was a level plot of ground on the shore of Jamaica Bay, L. I.; it was very favorable for the purpose, but the wind was high and gusty. The cannon used for the expanding shot was a bronze 6-pounder, rifled with a regular twist; but with shallow grooves somewhat broader than the lands, to prevent stripping of the lead. The conical expanding shot weighed 14½ lbs.—8½ more than spherical shot for the same gun; the charge of powder was only 11 ounces, and the distance from the target was 1,300 paces. The firing commenced about 2 p. m., and was continued throughout the whole afternoon. The firing was wide and irregular. This was owing in a great measure to bad powder, strong gusts of wind, and the want of a perfectly level platform for the gun carriage. The shot being so heavy for such a light gun, the recoil was very great; this tended to give unsteadiness to the carriage. A large number of military men and others interested in war implements were present. The great range of the expanding shot with such a small charge of powder, excited the surprise of all present. This is due to the complete absence of windage. The perfect security of the lead bands gave great satisfaction to those who witnessed the trials.

Bishop's breech-loading cannon is a smooth bore iron 12-pounder field piece, similar in form to the Dahlgren guns. The breech piece consists of a conical moveable iron plug, fitting into an opening in the rear of the cylinder. It swings on a vertical axis situated at one side, and it is moved in and out with ease and rapidity by a lever. It is immeasurably superior to the screw and loose plug of the Armstrong gun in being more easily operated. One very ingenious feature in the construction of the breech are a set of expanding dogs, moved by a small screw on the outside of the plug. These dogs are expanded when the breech is closed, and the discharge tends to make them fit more tightly, and completely prevent leakage. On the other hand, they are drawn together when the breech has to be opened, and this permits of its easy withdrawal. Very few shots were fired with this gun, but these were sufficient to show the facility and rapidity with which it could be loaded; it created a very favorable impression.

IN Belgium, the government has ordered the construction of some railway carriages for the especial conveyance of sick persons, which contain a suitably-furnished bed chamber, provided with special conveniences for those who may be suffering from broken limbs.

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Position of England.

Some of our cotemporaries are complaining of the attitude of the British government toward the United States in the present unhappy crisis. We confess that we do not fully share in this feeling. We are, in the main, satisfied when we are assured, by royal proclamation, that the government will maintain a strict neutrality, and that the effective blockade by our government of the Southern ports will be recognized and respected. The London *Times*, in reviewing the proclamation of her Majesty, after alluding to the fact of the war, says :—

From acknowledging the state of war the next step is to acknowledge the belligerent rights of the contending parties. One of them, the government of the United States, compelled us to recognize her existence in 1782, and has since, with a brief and unhappy interval of three years, been on terms of amity with us. The other has but just sprung into existence, and, unless Fortune favors, with more than her usual blind caprice, the less worthy cause and the weaker arm, may never be in a position to be recognized at all; but, as belligerents, they are as equal in our eyes as Trojan or Tyrian was in the eyes of Queen Dido. We are bound equally to respect their blockades, and equally to abstain from any act which may violate the conditions of the most impartial and undiscriminating neutrality. Hence arises the necessity of the proclamation which we publish to-day. It may be said to have a double object: First, to warn emphatically all the subjects of the Queen against any breach of the most complete and absolute neutrality; and, secondly, by proclaiming our determination to act with the most perfect fairness between the contending parties, to induce them to treat us in an exactly similar spirit.

Our government, at the time of the "patriotic war" in Canada, did not regard the revolting provinces as *belligerents having equal rights.* Neither have we offered any encouragement to the insurrection in India and elsewhere. We therefore presume that England, at least, will not regard the United States government as less entitled to respect than the so-called Confederate States of America.

Official Joking.

Joke No. 1.—The Committee on Foreign Affairs of the Confederate States, in a recent labored report, perpetrate the following excellent official joke: "*Our late associates in the government of the United States have seized the whole of the United States Navy, one half of which belongs to us, and design using it against us.*" The United States government is actually charged with having seized its own ships!

Joke No. 2.—The Congress of the Confederate States, through the person of Lawrence M. Keitt, Esq., an ex-M. C. from the State of South Carolina, is asked to extend its protection to the Indians south of Kansas. These Indians live upon United States territory, and are protected by treaties made with the Federal Government. The proposition, therefore, to protect them further sounds very much like a joke.

Joke No. 3.—Secretary-of-War Walker, of the Confederate States, prophesied that the Confederate States flag would fly over the Capitol at Washington before the 1st of May. A New Orleans journal, noticing the effect of this threat upon the supporters of the government, presumes now that the Secretary was only joking.

Joke No. 4.—The best joke of all is that Mr. Davis asks "to be let alone." Uncle Sam is expected either to stand on one side and allow Mr. Davis to pass, or to stand and deliver. All he asks is "to be let alone."

What is Secession?

It is our opinion that the real enemies of the South are those who have stimulated and led on the secession scheme and the war upon the government of the Union. What is secession? This question is thus answered by the committee appointed by the Western Virginia Convention in their Address to the people of that State. It is "a deed," says the Committee, "not to be accomplished in the broad glare of a noon-day sun, but a deed of darkness, which had to be performed in secret conclave, by the reckless spirits who accomplished it, in contempt of the people, their masters, under our form of governmenf, but whom the leaders in this work of destruction have determined to enslave. What is secession? Bankruptcy, ruin, civil war, ending in a military despotism. *Prior to the adoption of the Ordinance of Secession in Virginia, and to the passage by the Legislature of the bill calling a Convention, all was peace, and the great business interests of our State were uninterrupted. From the hour that it was proclaimed the Ordinance of Secession had been passed, business of every description has been paralyzed, State, corporation, and individual credit is prostrate, and bankruptcy and ruin stare us in the face, and war, civil war, with all its attendant horrors, is upon us. Secession, all now see, is war. It is preceded by war, accompanied and sustained by war, ushered into being by war.*"

Loyalty in Kentucky.

The Legislature of this State, now in session at Frankfort, passed an act requiring the State guard to take the oath to support the constitution of the United States.

A resolution was also offered that the Governor's proclamation was the true position that Kentucky should occupy during the strife between the United States and the Confederate States, but it was rejected. The position assumed by the Governor amounted, in substance, to a declaration of Kentucky's independence of the United States—a sort of left-handed secession. It would not go down.

Mr. Rosseau made a strong Union speech in the Senate, in favor of sustaining the government. He said he did not consider the Union now dissolved, and he had no fears that it would be. The time had passed for appeals to politicians not to dissolve the Union. Tufts of grass had been tried, and we would now see what virtue there was in stones.

To all appearance the feeling of loyalty to the government is increasing. The following incident recently transpired in the Kentucky Legislature :—

A venerable old farmer from a neighboring county, one of that kind for whom Kentucky has an instinctive veneration, appeared in the Legislative Hall, uncovered his snowy locks and sat down. At the first lull in the debate he rose slowly and said he had a word to say, but was aware it was out of order for him to speak before the Legislature while in session. His dignified and venerable appearance arrested attention, and "Go on," "Go on," from several voices, seemed to keep him on his feet. Again expressing his diffidence at speaking out of propriety—"Hear! hear!" resounded generally over the room. The members' curiosity as well as respect for the appearance and manner of the man was up, and silence followed the "hear! hear!" when the old hero delivered the following eloquent but laconic speech :—

"Gentlemen :—I am delegated by my county to inform you, that if you hold a secret session here, as you threaten to do, not one stone of this Capitol will rest upon another twenty-four hours after. Good day," and he left.

Non-interference with Slavery.

The Ohio Legislature has adopted, by the constitutional majority, the joint resolution of Congress passed at the last session proposing an amendment to the Constitution of the United States guaranteeing slavery in the States in which it now exists.

This does not look much like interfering with slavery in the States. Such an idea is not contemplated by the supporters of the government. Since the 71st Regiment have been in Washington, the guard have, in obedience to orders, arrested more than twenty fugitives escaping from different points in the South. Several have been returned, and a number are now under arrest, awaiting the appearance of their owners.

Major-General Butler, in command at Fortress Monroe, it seems refused to return some fugitives who fled to the fort for shelter. They were owned by a colonel in the secession army, who demanded them under the fugitive slave law. The general offered to return them if the owner would swear allegiance to the government; otherwise he should recognize them as contraband of war. Slaves have been used by the secessionists to fill sand bags, construct batteries, and we are informed many will fight against the government. General Butler held them, and set them at work.

Some idea may be formed of the spirit in which the government is going into the war business by a glance at an official advertisement which is published, calling for supplies. Proposals were to be opened on the 3d of June. Among the articles required we find the following :—

Cotton goods, various descriptions, yards	1,118,000
Flannel, various colors, yards	1,100,900
Cloth, various kinds, yards	415,000
Stockings, woolen, pairs	200,000
Blankets	50.000
Thread, pounds	14,000
Bunting, red, white, and blue, yards	50,000
Buttons, gross	27,000
Canteens	60,000
Mess pans	25,000
Camp kettles	10,000

—together with all necessary tents and tent equipage, axes, hatchets, shovels, spades, pickaxes, &c.

The London *Times*, on secession, states the South have "the less worthy cause and the weaker arm"

Cost of the War Forces.

The estimates for the cost of the projected increase of the army are being prepared in the War Department. The pay and clothing of one company of cavalry, amount to $3,000 a month—of infantry, $1,800 a month. A regiment of cavalry of twelve companies will cost, therefore, $1,800 a month. A regiment of cavalry of twelve companies will cost, therefore, $3,800 a month for pay and clothing, or $432,000 a year. Subsistence for men, at 30 cents a day, $109,500. Forage for horses at 50 cents a day, $162,500. Total cost of one regiment of cavalry for one year, for pay, clothing, and subsistence for men and horses, $604,000. Add to this the cost of mounting, equipping and arming the regiment—$235,000—and we have, as the expense of one cavalry regiment for one year, the sum of $839,100—exclusive of the expenses of the Quartermaster's Department, which will amount to at least $500,000 more. So that the cost to the government of the new regiment of cavalry for the first year, will not be less than $1,339,000.

An army of $50,000 men ought to have at least 10,000 cavalry, in ten regiments; the expenses of which, for the year, would be $13,339,000. The cost of equipping and maintaining the remaining 40,000—divided into artillery and infantry, in the existing ratio of two to five, which would give 11 regiments of artillery and 29 of infantry, would be, for the first year, not less than $46,000,000—or $53,339,000. An army of 100,000 men would, therefore, cost the government $106,678,000 a year. Less than this number will not suffice for our present exigencies.

What the New Hampshire "National Eagle" Says.

We quote largely, of late, from the *Scientific American.* Its information respecting the material and personel of the army and navy is accurate and superior, while its energy in promptly illustrating, in the best style of art, anything new, is worthy of all praise. The very week in which Winans' steam gun was captured by Massachusetts troops, the *Scientific American* appeared with an elegant engraving and history of it. Whoever would be thoroughly posted should not fail to take the *Scientific American.*

[Your remarks, Mr. "Eagle," are truthful, and we are going to continue our history of the war with suitable embellishments, believing nothing we can publish will be more acceptable to our readers or useful to the public. We wish you could make ten thousand of your Granite State residents sufficiently appreciate the truthfulness of your assertions to subscribe for our paper.—Eds.

Compliment to Our Soldiers.

Henry Addison, Esq., Mayor of Georgetown, D. C., has just addressed a letter to Colonel Corcoran, of the Sixty-ninth Regiment, in which he says :—

It is but an act of justice to your distinguished regiment to say, as I do now, with a great deal of pleasure, that since its very welcome arrival here its members have conducted themselves with a propriety of conduct that has attracted the admiration and respect of the whole community. Indeed, so quiet and unobstrusive have been your soldiers, that, but for their imposing march into our town some weeks since, we should hardly have been aware of their presence. I trust you are aware of our high appreciation of the valor and patriotism which have prompted the Sixty-ninth Regiment to repair here for the defense of our homes, our lives and our capital, and how much we would regret any discourtesy to friends to whom we owe a debt of gratitude that can never be cancelled.

Southern Correspondence.—We publish, on another page, some highly seasoned letters from Southern correspondents. At this particular time they will be found very readable. Our readers will notice that while some of the writers are slightly disturbed in their imagination, the correspondent from Camden, S. C., the hot bed of secession vegetation, is cool and collected, and though reasoning from unfounded apprehension, he still retains his reason, and does not act as if he wanted to kill somebedy. Our readers must not wholly judge Southern character from the bellicose standard assumed by friends Whitson and Alderson. We have constant evidence of the patriotic loyalty of many Southern men. They regret this sad secession blunder, and see clearly that they have been deceived by the leaders.

The Demand and Supply. — Nothing better illustrates the aptness of the American people than their readiness to supply any want for which there arises a general demand. A large proportion of the patents which have been solicited through this office, within the past month, pertain to ordnance and projectiles, tents, and other articles relating to the war.

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Peter the Great in England.

The following extracts from Macaulay's description of Peter the Great's visit to England are taken from the last volume of his history, just published by Harper & Brothers:—

In the same week in which Whitehall perished, the Londoners were supplied with a new topic of conversation by a royal visit, which, of all royal visits, was the least pompous and ceremonious, and yet the most interesting and important. On the 10th of January, a vessel from Holland anchored off Greenwich, and was welcomed with great respect. Peter the First, Czar of Muscovy, was on board. He took boat with a few attendants, and was rowed up the Thames to Norfolk-street, where a house overlooking the river had been prepared for his reception.

His journey is an epoch in the history not only of his own country, but of ours and of the world. To the polished nations of Western Europe, the empire which he governed had till then been what Bokhara or Siam is to us. That empire, indeed, though less extensive than at present, was the most extensive that had ever obeyed a single chief. The dominions of Alexander and of Trajan were small when compared with the immense area of the Scythian desert. But, in the estimation of statesmen, that boundless expanse of larch forest and morass, where the snow lay deep during eight months of every year, and where a wretched peasantry could with difficulty defend their hovels against troops of famished wolves, was of less account than the two or three square miles into which were crowded the counting houses, the warehouses and the innumerable masts of Amsterdam.

The Czar had no permanent minister here. We had no permanent minister at Moscow ; and even at Archangel we had no consul. Three or four times in a century extraordinary embassadors were sent from Whitehall to the Kremlin, and from the Kremlin to Whitehall

The English embassies had historians whose narratives may still be read with interest. Those historians described vividly, and sometimes bitterly, the savage ignorance and the squalid poverty of the barbarous country in which they had sojourned. In that country, they said, there was neither literature nor science, neither school nor college. It was not until more than a hundred years after the invention of printing that a single printing press had been introduced into the Russian empire, and that printing press had speedily perished in a fire which was supposed to have been kindled by the priests. Even in the Seventeenth century, the library of a prelate of the first dignity consisted of a few manuscripts. Those manuscripts, too, were in long rolls, for the art of bookbinding was unknown. The best educated men could barely read and write. It was much if the secretary to whom was intrusted the direction of negotiations with foreign powers had a sufficient smattering of Dog Latin to make himself understood. The arithmetic was the arithmetic of the Dark Ages. The denary notation was unknown. Even in the Imperial Treasury, the computations were made by the help of balls strung on wires. Round the person of the sovereign there was a blaze of gold and jewels ; but even in his most splendid palaces were to be found the filth and misery of an Irish cabin. So late as the year 1663, the gentlemen of the retinue of the Earl of Carlisle were, in the city of Moscow, thrust into a single bedroom, and were told that if they did not remain together they would be in danger of being devoured by rats.

It might have been expected that France would have been the first object of his curiosity. But from some cause which cannot now be traced, he had a taste for maritime pursuits which amounted to a passion ; indeed, almost to a monomania. His imagination was full of sails, yardarms and rudders. That large mind, equal to the highest duties of the general and the statesman, contracted itself to the most minute details of naval architecture and naval discipline. The chief ambition of the great conquerer and legislator was to be a good boatswain and a good ship's carpenter. Holland and England, therefore, had for him an attraction which was wanting to the galleries and terraces of Versailles. He repaired to Amsterdam, took a lodging in the dockyard, assumed the garb of a pilot, put down his name on the list of workmen, wielded with his own hand the caulking iron and the mallet, fixed the pumps and twisted the ropes. Ambassadors who came to pay their respects to him were forced, much against their will, to clamber up the rigging of a man-of-war, and found him enthroned on the crosstrees.

Such was the prince whom the populace of London now crowded to behold. His stately form, his intellectual forehead, his piercing black eyes, his Tartar nose and mouth, his gracious smile, his frown black with all the stormy rage and hate of a barbarian tyrant, and, above all, a strange nervous convulsion which sometimes transformed his countenance, during a few moments, into an object on which it was impossible to look without terror, the immense quantities of meat which he devoured, the pints of brandy which he swallowed, and which, it was said, he had carefully distilled with his own hands, the fool who jabbered at his feet, the monkey which grinned at the back of his chair, were, during some weeks, popular topics of conversation. He meanwhile shunned the public gaze with a haughty shyness which inflamed curiosity. He went to a play ; but, as soon as he perceived that pit, boxes and galleries were staring, not at the stage, but at him, he retired to a back bench, where he was screened from observation by his attendants. He was desirous to see a sitting of the House of Lords ; but as he was determined not to be seen, he was forced to climb up to the leads, and to peep through a small window. He heard with great interest the royal assent given to a bill for raising fifteen hundred thousand pounds by land tax, and learned with amazement that this sum, though larger by one half than the whole revenue which he could wring from the population of the immense empire of which he was absolute master, was but a small part of what the Commons of England voluntarily granted every year to their constitutional king.

William judiciously humored the whims of his illustrious guest, and stole to Norfolk-street so quietly that nobody in the neighborhood recognised his majesty in the thin gentleman who got out of the modest-looking coach at the Czar's lodgings. The Czar returned the visit with the same precautions, and was admitted into Kensington House by a back door. It was afterward known that he took no notice of the fine pictures with which the palace was adorned. But over the chimney of the royal sitting room was a plate which, by an ingenious machinery, indicated the direction of the wind, and with this plate he was in raptures.

He soon became weary of his residence. He found that he was too far from the objects of his curiosity, too near to the crowds to which he was himself an object of curiosity. He accordingly removed to Deptford, and was there lodged in the house of John Evelyn, a house which had long been a favorite resort of men of letters, men of taste and men of science. Here Peter gave himself up to his favorite pursuits. He navigated a yacht every day up and down the river. His apartment was crowded with models of three-deckers and two-deckers, frigates, sloops and fire-ships. The only Englishman of rank in whose society he seemed to take much pleasure was the eccentric Caermarthen, whose passion for the sea bore some resemblance to his own, and who was very competent to give an opinion about every part of a ship, from the stem to the stern.

The Czar could not be persuaded to exhibit himself at St. Paul's ; but he was induced to visit Lambeth Palace. There he saw the ceremony of ordination performed, and expressed warm approbation of the Anglican ritual. Nothing in England astonished him so much as the archiepiscopal library. It was the first good collection of books that he had seen ; and he declared that he had never imagined that there were so many printed volumes in the world.

The impression which he made on Burnet was not favorable. The good bishop could not understand that a mind which seemed to be chiefly occupied with questions about the best place for a capstan and the best way of rigging a jury mast might be capable, not merely of ruling an empire, but of creating a nation. He complained that he had gone to see a great prince, and had found only an industrious shipwright. Nor does Evelyn seem to have formed a much more favorable opinion of his august tenant. It was, indeed, not in the character of tenant that the Czar was likely to gain the good word of civilized men. With all the high qualities which were peculiar to himself, he had all the filthy habits which were then common among his countrymen. To the end of his life, while disciplining armies, founding schools, framing codes, organizing tribunals, building cities in deserts, joining distant seas by artificial rivers, he lived in his palace like a hog in a sty ; and when he was entertained by other sovereigns, never failed to leave on ther tapestried walls and velvet state beds unequivocal proofs that a savage had been there

Toward the close of March the Czar visited Portsmouth, saw a sham sea-fight at Spithead, watched every movement of the contending fleets with intense interest, and expressed in warm terms his gratitude to the hospitable government which had provided so delightful a spectacle for his amusement and instruction. After passing more than three months in England he departed in high good humor.

RECENT AMERICAN INVENTIONS.

Sewing Machines.—This invention consists in so applying, combining, and operating the needle and shuttle of a sewing machine, that the shuttle will pass twice in the same direction through every loop of the needle thread that is carried through the cloth, and thereby cause the shuttle thread to be coiled at least once completely round every loop of the needle thread. It also consists in an improvement in the presser, whereby it is made to adapt itself better to irregularities in the thickness of the work. The patentee of this invention is J. P. Sherwood, of Fort Edward, N. Y.

Mastic Roofing.—This invention consists, first, in treating gas tar, before it is mixed with the other ingredients composing the roofing, with chloride of lime, under application of heat, in such a manner that the free acids, which are mixed with the tar, and which with ordinary roofing prove very destructive to the canvas, are neutralized, and at the same time the tar is deodorized, and the bad smell generally arising from mastic roofing is obviated ; second, in mixing gas tar previously treated with chloride of lime as stated, with black oxyd of manganese, plaster-paris, alum and charcoal, and applying this composition to canvas, after the same has been properly fastened down to the roof. The inventor of this device is Cornelius C. Hoff, of Pougkeepsie, N. Y.

Strawberry Basket.—This invention relates to an improved basket such as is used for conveying strawberries and similar fruit to market, and in which they are generally sold. The object of the invention is to obtain a cheap, and at the same time a more durable basket than those constructed of wood splints in the usual way, and which will admit of being stowed away more compactly, both when filled and empty. The invention consists in constructing the body of the basket of thin sheet metal, cut by means of suitable dies to form ribs or splints, and bending the same at their lower ends, so that they will, in connection with circular disks, form the bottom of the basket, the top of the basket being provided with a swinging or bail handle. S. R. Wilmott, of Brooklyn, N. Y., is the inventor.

The shuttle Motion of Power Looms.—This invention relates to the employment for keeping the movement of the operating point of the picking stick in, or as nearly as desirable, in a line parallel with the raceway, by means of a rocker attached to the bottom of the stick and a bed at the bottom of the lay. The improvement consists in a certain novel construction of the rocker, and the part of the lay which contains the bed on which the rocker works, whereby the liability of the parts to break, get out of repair, or become displaced, is in a great degree obviated. The inventor of this device is William Nugent, of Chicopee, Mass.

Carriages —This invention relates to a novel and improved way of combining the elliptic and C-spring, and attaching or applying the same to the hinder parts of carriages, whereby a requisite degree of elasticity is combined with strength, and a very neat and chaste carriage obtained. In the construction of carriages, style, ease in riding, and lightness combined with strength are the essential desiderata to be attained. The two latter requisites for city carriages are not very readily obtained, as the stone pavement is the source of concussions and great wear and tear, even with moderate driving. By this invention it is believed that the above named requisites are fuly obtained, and by a very simple and economical arrangement. Charles B. Wood, of New York city, is the inventor of this device.

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Movement of Troops.

Every day witnesses the departure of troops from this city. Colonel Duryee's regiment of Zouaves, which was reviewed on the 23rd ult. with so much favor, is now quartered at Fortress Monroe, under command of General Butler. This regiment is made up of brave, determined men, and under command of the gallant Duryee will do service that will make the country proud of them. The Eighth Regiment (German rifles), composed of 1,046, under command of Colonel Blenker, went to Washington on the 27th. The officers are men who have had much experience upon the battle fields of the old world. Colonel Blenker was in the Grecian army, and took part in many battles, particularly those of Achino and St. Marino, after which engagements King Otho promoted him to a place upon his staff, and presented him with medals of honor; he was subsequently commander-in-chief of the army of the revolution. He has a thorough military education, and is regarded as one of the best soldiers now in the field. The uniform of this company is admirable, consisting of gray pants, and a loose gray coat, with a short belt, by which it can be tightened or loosened about the waist at pleasure, and they are armed with Sharp's rifles. A corps of sappers and miners preceded the soldiers, provided with axes, spades, picks and other tools likely to be needed in this department, and a long leather apron. They have two ambulances and about eight horses, some of which belong to the officers. Each company has two portable cases containing bandages, lint, plasters, chloroform, and other articles necessary for hospital use. A large body of citizens escorted the regiment to the depot at Jersey City, where they took the cars for Washington, singing a German song of departure for the wars, as the long train moved off.

The Ninth Regiment, under command of Colonel Styles, which, as regards physical ability, moral training and intelligence, is not to be excelled by any in the Constitutional army. It is composed of over 800 men. This regiment started for Washington at the same time with Colonel Blenker's, the whole force occupying thirty-seven cars.

The Garibaldi Guard departed for Washington on the 28th. This regiment is composed of foreigners, a very large proportion of whom have seen service. It is commanded by Colonel d'Utassy, an experienced and able officer, who has served, as well as most of the other officers, in the wars of Hungary, Italy and the Crimea.

Colonel Bartlett's Naval Brigade consists of over one thousand men. This brigade was ordered to Fortress Monroe on the 29th to co-operate with General Butler in the approaching demonstration upon Norfolk.

REGIMENTS IN THIS CITY.

On the 27th ult. there were quartered in this city the following regiments:—

Naval Brigade, Colonel Bartlett; Excelsior Brigade, General Sickles; Empire City Regiment, Colonel Sheehan; Thirty-sixth (Connaught Rangers), Colonel McCunn; Anderson Zouaves, Colonel Ricker; British Volunteers, Lieut. Colonel Torre; President Guards, Colonel Goodwin; Imperial Zouaves, Colonel Merritt; Washington Volunteers, Colonel Innes; Second Regiment Fire Zouaves; Mozart Regiment, Colonel Cocks; Tammany Regiment, Colonel Kennedy; Third Regiment, Colonel Townsend; Fourth Regiment, Colonel Taylor; Sixth Regiment, Colonel Wilson; Ninth, Colonel Hawkins; Tenth, Colonel McChesney; Fifteenth, Colonel McLeod Murphy; Seventeenth, Colonel Lansing; Twentieth, Colonel Weber; Twenty-fifth, Colonel Kenyon; Twenty-ninth, Colonel Steinwehr; Thirty-first, Colonel Pratt; Thirty-fourth, Colonel Mathewson; Thirty-eighth, Colonel Ward.

These regiments are rapidly preparing to take the field. They will constitute, when fully equipped, a more formidable army than the government has hitherto employed in times of peace. General Sickles' brigade is to embrace ten thousand men.

VALUE OF A MOUSE TRAP.—A correspondent—R. T. Martin, of Winona, Minn.—in a letter to us, says:—"On page 115, Vol. 12 (old series), SCIENTIFIC AMERICAN, there is an account given of a cheap mouse trap, which consists of a pipe-bowl filled with cheese and placed under the edge of a tumbler. This alone has been worth to me, more than all I have paid for your paper, which I have taken for eight years."

RUSSIAN PACIFIC TELEGRAPH.—The plan for establishing a telegraphic line connecting Europe, through Siberia, with the Pacific ocean, has been undertaken by the Russian Ministry of Marine. It is expected that the entire line from St. Petersburg to the Pacific will be completed in five years.

WELLS' FIRST PRINCIPLES OF GEOLOGY.—The inquiry is often made of us, what book we can recommend to students and others who are desirous of acquiring an elementary knowledge of geology. Having had an opportunity of thoroughly examining a work recently published by Messrs. Ivison & Phinney, of this city, the title of which we give above, we are able to answer the question to our utmost satisfaction. The author, Mr. David A. Wells, is well known to the public, especially to those interested in school books, for his admirable works on chemistry and natural philosophy, and also as the editor of the "Annual of Scientific Discovery." The work in question cannot fail to enhance his reputation. This subject of geology, usually so obscure to a beginner, he has treated with the utmost simplicity, and yet with great thoroughness, avoiding as much as possible the use of dry technicalities and minute discussions. The applications of the subject to the arts and every day life are also fully noticed, which give to the book a freshness and interest, and render it exceedingly attractive. The illustrations are numerous, and different entirely from the old stereotyped pictures which have been doing duty for years. For elementary instruction we cordially recommend this work as by far the best of any before the public; advanced students who are desirous of posting themselves respecting the latest views and theories in geology will find it exceedingly interesting and valuable for reference.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING MAY 14, 1861.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 4, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

1,266.—John Adt, of Waterbury, Conn., for an Improvement in Latch Bolts:

I claim the latch, B, in connection with the cylinder, C, provided with the hole, e, rod, E, with spring, g, applied, and the cross bar, F, when arranged to operate as and for the purpose set forth.

[The object of this invention is to obtain a combined lock and latch of very simple construction and one that may be economically manufactured. The invention consists in applying to an ordinary slide latch a locking cylinder, spring, rod, and a cross-bar, whereby the desired result is obtained.]

1,267.—Charles Askam, of Philadelphia, Pa., for an improvement in Children's Carriages.

I claim the car-shaped springs, G G, the body, H, the rear axle, E, and cross bar, C, when constructed, arranged and combined, as and for the purpose set forth.

1,268.—Henry Benton, of Guilford, Conn., for an Improvement in Children's Flying Tops;

I claim the employment or use, in combination with a spinning top, of spiral flanches, B, so applied as to give the top a rising and falling movement, simultaneously with its rotating one, substantially as set forth.

[This invention consists in providing a spindle with a series of spiral flanches, in such a manner that, by rotating the spindle by means of a top-cord, the flanches will cause the spindle to rise or ascend a certain distance before it comes in contact with the ground or floor, thereby combining a rotary and an elevating movement which greatly adds to the amusement of spinning tops.]

1,269.—L. S. Bundy and L. F. Edgerson, of Hyde Park, Vt., for an improvement in Corn Shellers.

We claim the construction and arrangement of the feeder, D, spring, d′, uprights, D′ and E, with cogs, d, as and for the purpose set forth.

1,270.—L. C. Chase, of Boston, Mass., for an improved mode of stringing Sleigh Bells:

I claim constructing a sleigh bell with two shanks, a a, and a hole between them, and confining it to the strap by means of a single rivet passing through the strap, between said shanks, and headed down inside of the bell, substantially as described and for the objects specified.

1,271.—Ira Cooper, of Saybrook, Ohio, for an Improvement in Cultivators:

I claim the special arrangement of the adjustable mold-board, F, in combination with the mold-boards, A A, space, A′, coulter, L, and braces, P, O, M, N, when arranged in the manner and for the purpose set forth.

1,272.—N. T. Edson, of New Orleans, La., for an Improved Wheelwright's Machine:

I claim the combination of the form or stand, L, G, 4, bolt, B, head piece, 1, ring, 5, and supporting tube or thimble, A, constructed and operated substantially as described.

1,273.—W. T. Clement, of Northampton, Mass., for an Improvement in securing Handles to Hoes:

I claim the fixing of handles to hoes and other tools by the combination of the screw shank, B, which is a combination of the tool itself with the taperiag socket, C, and perforated and tapered handle, D, so that the tool is fixed to both, C and D, substantially in the manner and so as to possess the advantages set forth.

1,274.—J. P. Ellicott, of Washington, D. C., for an Improvement in Apparatus for Irrigating Streets:

I claim the cap, c, with its concave sides, f f, for the purpose of flattening the water issuing from the jets or perforations, b b, thereby conforming the same to the arch of the street, and at the same time serving as a protection to the pipe, E, and perforations, b b, as set forth.

Second, in combination with the above, I claim the perforated pipe, B, for the purpose and use expressed.

1,275.—S. M. Fales, of Baltimore, Md., for an Improvement in Refining and Smelting Furnaces:

I claim extending one or more of the arches, A, of the furnace, B D, constructed as set forth in my patent dated Feb. 8th, 1859, and having the said extended arch or arches communicate by a flue with an auxiliary stack or chimney, or with a series of anxiliary stacks or chimneys, C, substantially as and for the purposes set forth.

1,276.—S. M. Fales, of Baltimore, Md., or an Improvement in Refining and Puddling Furnaces:

I claim, first, the combination with my improved patented furnace, bearing date Feb, 8, 1859, of a puddling chamber, D′, a secondary draft chimney or stack, F, and a division wall, E, with draft passage, b, through it, substantially as and for the purposes set forth.

Second, The combination with the puddling chamber, D′, perforated division wall, E, draft chimney, F, stack or cone, D, of the furnace, patented to me and bearing date Feb. 8th, 1859, of a return pipe or passage, G, substantially as and for the purposes set forth.

1,277.—I. J. Fearing, of South Weymouth, Mass., for an Improvement in Button-Hole Cutters:

I claim a supplemental cutting blade, A, constructed substantially as described, and applied to a pair of scissors, to operate substantially as and for the purpose set forth.

[See engraving in this number.]

1,278.—Joseph Forrest, of New York City, for an Improvement in Machines for Breaking Sugar:

I claim the combination of two grooved rollers, D, and E, working together, one of which is grooved lengthwise, the other circumferentially on its periphery, and one or more pairs of rollers armed with teeth, the whole arranged substantially as and for the purpose set forth.

1,279.—J. S. Gauson and C. T. Coit, of Buffalo, N. Y., for an Improvement in Fire Places:

First, We claim so constructing the fire back, B, as that it will extend upward and above the mouth of the chimney and then downward and forward, as shown at b′, with semi-circular bend, b2, receding again upwardly as shown at b3, for the purposes and substantially as described.

Second, Said fire back being constructed substantially as described, we claim in combination and arrangement therewith the jacket, N, for the purposes set forth.

Third, We claim the combination of the tube or air chamber, L, with the recess, D, as and for the purposes set forth.

2,280.—John S. Getchell, of Machias, Me., for an Improved Combined Capstan and Windlass:

I claim the combination with the vertical capstan herein described of the box, C, gear wheels, F, f, shafts, G G′, shaft, I, drum, J, and movable standard, K, all arranged and operating substantially as and for the purposes set forth.

[This invention relates to the combination with a ship's capstan of a windlass so that either one or the other may be employed, as occasion requires.]

1,281.—D. F. Goodhue and E. H. Carey, of Cincinnati, O., for an Improvement in Wheel Carriages:

We claim the combination herein described of the spokeless rings, G, grooved supporting wheels, B, axle, C, grooved guide rollers, H H′ H″, and springs, F, the whole being constructed, arranged, and operating in the manner and for the purposes set forth.

1,282.—W. C. Grimes, of Philadelphia, Pa., for an Improvement in City Railroads:

I claim the double track, C and D, constructed substantially as described and for the purpose set forth.

1,283.—F. R. Grumel, of Geneva, Switzerland, for an Improvement in Photographic Album:

I claim, first, the construction of leaves for albums for collection of photographic or lithographic proofs, engravings or other drawings, with an opening or frame on each side, so that two proofs, engravings, or drawings may be inserted back to back, thereby showing one on either side, substantially as shown and described.

Second, The formation of leaves for photographic or other album by combining with a front and back framing leaf a center leaf recessed and of such thickness as that when containing one or two photographic cards, they shall be flush with the general surface of the leaf, as specified.

Third, The construction of leaves for photographic or other album, by pasting or otherwise permanently fixing the front and back framing leaf on to the center leaf on three sides thereof, leaving one side open and free for the insertion of photographic cards or drawings, as described.

Fourth, In combination with leaves constructed and arranged as described, I claim the filling piece for closing the gap formed for the ready insertion of the photographic cards, between the framing leaves substantially as specified.

1,284.—James M. Hicks, of Boston, Mass., for an Improvement in Erasers:

I claim, first, Providing the eraser blade with an independent back made of bone, rubber, ivory, wood, or other suitable animal or vegetable substance or substances, separate or combined, essentially as and for the purpose or purposes set forth.

Second, Forming an independent supporting and burnishing back to the blade by extending the handle which carries the latter, substantially as described.

Third, Uniting the blade with the handle by inserting it in a cross-cut or slot in the end of the handle, in combination with riveting or holding it by pins to the independent back formed by extension of the handle, essentially as specified.

Fourth, The combination with an erasing blade of metal or its equivalent and handle thereto, of an india rubber eraser or burnisher, as set forth.

1,285.—J. J. Hirshbühl, of Louisville, Ky., for an Improvement in Locks:

I claim, first, The employment or use of the latch-bolt, E, when combined with tumblers, G G′, one or more, a catch, H, and a nosing, D, provided with a slot, a, arranged as and for the purpose set forth.

Second, The slide bolt, K, when used in connection with the latch bolt, E, tumblers, M N, dog, L, and the rod, O, on the latch bolt, E, as and for the purpose specified.

[The object of this invention is to obtain a lock that will be burglar proof, or unpickable, and still be simple in arrangement and economical to construct.]

1,286.—C. C. Hoff, of Poughkeepsie, N.Y., for Mastic Composition for Roofing:

I claim the described composition of gas tar, treated and prepared in the manner specified, black oxyd of manganese, boiled plaster of Paris, alum, and calcined charcoal, mixed together in the manner and about in the proportion stated, and applied to the canvas, substantially as and for the purpose set forth.

1,287.—H. S. Holmes, of Lynn, Mass., for Improvement in Congress Gaiters:

I claim securing the upper edge of the cloth of the front and heel parts of a Congress gaiter top to their respective linings by an inside seam, b, figs. 8 and 11, when such seams are used in connection with gores of elastic cloth attached to the gaiter top and lining, by a seam common to all, the whole being effected in the manner described and for the purposes set forth.

1,288.—Nelson Homes, of Leona, N. Y., for an Improved Broom Clasp:

I claim the combination of the bars or slips, A A A A, and bands, L L, in their application to brooms and brushes, as described, the whole being arranged and operating substantially as and for the purpose set forth.

1,289.—B. B. Hotchkiss, of Sharon, Conn., for Improved Projectile for Rifled Ordnance:

I claim, first, The arrangement of the inclined surfaces or cones, B, and f, and the cylindrical portion, a, in connection with the ring of soft metal, D, placed between B and f, substantially as and for the purpose specified.

Second, I claim the employment of a quantity of lubricating material, E, within proper recesses in the body of the projectile and in front of the belt, D, so arranged that a portion of the whole shall be forced out to lubricate the bore, by the action of the metal ring, D, or its equivalent, substantially as specified.

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Third, I claim the employment of the projecting ring, G, made to fit the bore of the gun, in combination with the cap, F, and belt, D, substantially as and for the purpose herein set forth.

Fourth, I claim, covering the belt, D, with cloth or other suitable material, H, wound spirally thereon, substantially as and for the purpose above described.

Fifth, I claim cutting the patch, H, after the belt, D, has been sufficiently expanded by means of the lips, C, f', or their equivalents, substantially as and for the purpose specified.

1,290.—H. J. Howe, of Onarga, Ill., for Improvement in Corn Planters:

I claim, first, The arrangement of the tappet, K, on axle, L, the lever, J, segment rack, H, with sliding weight, h, and pinion, d, on shaft, G, substantially as and for the purpose set forth.

Second, The arrangement of the bent lever, B', attached to the frame, A, and draft pole, C', the semicircular racks, A', and pawl stop, a', as and for the purpose set forth.

[This invention relates to a novel and improved means for operating the seed-distributing device, whereby the latter may be actuated by the driver when planting in check-rows is required; or, actuated automatically from one of the ground wheels when it is designed to plant in rows for cultivation, in one direction only.]

1,291.—S. W. Howland, of Adams, Mass., for an Improvement in Knitting Machines:

I claim the changeable pressing sinker plate on the wheel, so as to be able to ship one or more needles, and press the other, simply by changing this plate without changing the whole wheel.

1,292.—John, Jefferson, and James McCausland, of Rondout, N. Y., for Improved Steering Apparatus:

We claim the arrangement of the pin or stud, b, in combination with the hinged reversible tiller, A, as and for the purpose shown and described.

1,293.—William Jones, of Brooklyn, and Patrick Hanghain, of New York City, for improvement in Sewing Machines:

We claim, first, the side-pointed needle, as described.

Second, The combination of the needle with the fork and shuttle, as described.

Third, The combination of the guide with the fork and needle, as described.

Fourth, The combination of the feed chain with the fork and needle, as described.

Fifth, Retaining the needle thread, in making the stitch, on the side of the needle opposite to the shuttle, substantially as set forth.

1,294.—Henry Knight, of Jersey City, N. J., for an Improvement in the Manufacture of Hydraulic Cement Pipes:

I claim, first, Manufacturing cement pipes with metallic pipe intermediate between its inner and outer surfaces, by arranging the metallic pipe over the core, B, and within the mold, F, so that it divides about equally the space between the core and the mold, and then placing an annular centering device, I, between the pipe and the mold, and introducing the cement first between the metallic pipe and the core, and then between the pipe and the mould, all substantially in the manner and for the purpose described.

Second, Finishing the sections of the combination pipes at one of their ends with a metallic coupling extension, J, by means and in the manner substantially as described.

1,295.—Thos. Langdon and H. C. Kellogg, of Quasqueton, Iowa, for an Improved Broom:

We claim the employment or use of the wedge, E, and screw, C, attached to handle, A, in combination with the cap, D, the above parts being applied to the broom corn, I, and all arranged substantially as and for the purpose set forth.

We further claim, in combination with the screw, C, wedge, E, and cap, D, a cross rod, H, attached to the clasp, G, and passing through the eye, a, of the screw, to prevent the casual turning of the latter, as specified.

[The object of this invention is to obtain a ready and simple means whereby brooms may be manufactured by any one unskilled in the art as at present practiced, and farmers and others who raise broom corn may keep themselves supplied with brooms of their own manufacture at a trifling cost.]

1,296.—Denis Lenain, of New York City, for an Improvement in Boots and Shoes:

I claim the construction of boot heels with a bolt, E, passing down through the sole into the shell, C, and through the filling block, D, where the screw receives a nut, d, all of the above parts being arranged as shown, and employed in connection with the bottom leather cover, F, as set forth, for the purposes described.

[This invention relates to an improvement in the heels of boots and shoes, and has for its object durability, lightness, facility and economy in the construction thereof, as well as facility in repairing the same when necessary.]

1,297.—M. H. Mansfield, of Ashland, Ohio, for an Improvement in Hangers for Shafting:

I claim the making of journal boxes for shafting for threshing machines adjustable, horizontally, vertically and obliquely, by means of the standards, A, ring, E, and screws, C C and F F, when arranged in relation to the journal box, G, as specified, thus giving it free motion in every direction, as and for the purpose set forth.

1,298.—J. S. Marsh, of Lewisburg, Pa., for an Improvement in Seed Drills:

I claim, first, The combination of the distributing roller, F, hinged journal, G, of the distributing roller, sliding bearing plate, J, having curved slots, e e, in it, supporting casting, K, coupling pins, d d, pinion, H, spur wheel, I, lever bar, E, with crank-shaped journal, g, on its end, and drill teeth, D, substantially in the manner and for the purpose set forth.

Second, The combination of the crank-shaped journal, g, slotted bearing slide or plate, J, and hinged journal, G, in the manner and for the purpose described.

Third, The combination of the revolving cellular distributing roller, E, hopper, E', sliding seed gate, N, slotted lever plate, P, and guide casting, O, in the manner and for the purpose described.

1,299.—Henry Maule, of Philadelphia, Pa., for an Improved Time Tell-tale:

I claim the door, B, with slits, e and f, arranged at suitable intervals, the permanent plate, F, of slate, or other suitable material, and the intervening detachable plate, E, with its single slit, i, the whole being arranged, applied to a clock and operating as set forth, so that it is impossible to mark the plate, F, through any slit of the door other than that which coincides with the slit, i, of the plate, E, as specified.

1,300.—William McClure, of Peebles, Pa., for an Improved Sad Iron:

I claim the use of a shoe, constructed substantially as described, so as to fit on the bottom of sad irons, and so arranged with spring lugs or other mode of attachment as to be easily attached to the iron or removed therefrom at pleasure.

1,301.—W. H. Miller, of Philadelphia, Pa., for an Improved Low Water Alarm for Steam Boilers:

I claim the metal tube, L, and the float valve, M, working within the glass tube, G, in the manner and for the purpose specified above and for no other purpose.

1,302.—Daniel Miller, of Marietta, Ohio, for an Improved Cork Fastener for Bottles:

I claim, as an improved article of manufacture, a bottle cork fastener that has the arms, a, of its cap, b, pivoted in the rear of the center of the neck collar, B, and otherwise made as shown and described.

[This invention is applicable to any kind of bottles which are used for holding fermented liquids, but it is more especially intended for mineral water bottles for holding the corks in the bottles, and to take the place of wire fastenings now so numerously used on mineral water bottles.]

1,303.—Samuel Mowry, of Whomelsdorf, Pa., for an Improvement in Horse Rakes:

I claim the combination of the bent arm, s, and catch, t, with the levers, H and e, and their connecting mechanism for operating the rake, when the several parts are arranged for joint operation, in the manner described.

1,304.—William Nugent, of Chicopee, Mass., for an Improvement in Picker Motion:

I claim the rocker, E, constructed with a straight bottom and downward projecting piece, e, and the box, D, constructed as described, to receive the bottom of the rocker and contain the bed for the same to work upon, and with a dovetail recess, f, in front for the reception of projection, e, the whole combined substantially as set forth.

1,305.—S. E. Oviatt, of Richfield, Ohio, for an Improvement in Threshing Machines:

I claim the wire cloth diaphragm, E'', in combination with the revolving screen, E', and thresher, for the purpose set forth.

I also claim the canvas covering or hood, M, in combination with the stacker, for the purpose specified.

1,306.—Suspended.

1,307.—Thomas Patterson, of Rush, Ill., for an Improvement in Plows:

I claim the plow body, G, secured to jointed beam, E, as described, in combination with straps, d d, lever, F, jointed bar, h, chains, K K, and jointed sliding crosstree, D', all arranged and combined with the wheels, B B', axle, A, and draught pole, D, as and for the purposes set forth.

[This invention is an improvement in operating turn plowshares for very heavy or light plowing, wherein the plow is supported under a carriage, and raised and depressed by the plowman while sitting on carriage.]

1,308.—Thomas Powers, of Philadelphia, Pa., for an Improvement in Gas Regulators:

I claim the combination and arrangement of the double-acting ball valve, A, with the hollow sliding tube, L, and the perforated hemispherical disk, K, operating substantially as set forth.

1,309.—J. R. Robinson, of Boston, Mass., for an Improvement in Steam Boiler Furnaces:

I claim the two walls, C D, and their interposed chamber, E, and passages, d e e, constructed and arranged between the fire chamber, A, and gas mixing chamber, B, substantially as and for the purpose specified.

And in combination with the said walls, interposed chamber and passages, I claim the described arrangement of the passage or passages, f, for the purpose specified.

1,310.—Thomas Sanford, of Claremont, N. H., for an Improved Steam Cock:

I claim my improved steam cock, as constructed with its parts, B C, hollow and to screw together, or one on or in the other, and with one of them provided with a lateral opening, d, substantially as specified, the whole being applied to the stem, D, and partition, c, as and so as to operate as described.

1,311.—J. P. Sherwood, of Fort Edward, N. Y., for an Improvement in Sewing Machines:

I claim, first, In combination with a needle and shuttle, applied, combined and operating together as specified, the employment of the drawback mechanism, operating to draw back the whole of the slack of the needle thread loop through the cloth between the first and second passages of the shuttle through it, substantially as described.

Second, Though I do not claim broadly the employment of rollers in the presser foot, I claim the combination of the laterally oscillating foot, f, and the rollers, g g, having a convex longitudinal profile, substantially as and for the purpose specified.

1,312.—Lorenzo Sibert, of Mount Solon, Va., for an Improvement in Magazine Firearms:

I claim, first, The combination of the series of magazine tubes, B, with the barrel, A, and breech, D, substantially in the manner and for the purpose described.

Second. The conveyer, G, when arranged and operating substantially as set forth.

Third, An open breech, so constructed as to permit the unobstructed passage of a cartridge directly through the same from top to bottom, substantially in the manner described.

Fourth, The combination of the fluted rollers, F F', or their equivalent, for the purpose of forming an open chamber to receive and hold the loaded cartridge, and discharge it when exploded.

Fifth, The combination of the magazine tube, B, conveyer, G, hammer, J, and fluted rollers, F F', or their equivalent, substantially as and for the purpose set forth.

Sixth, Expelling the empty cartridge case from the discharge chamber by means of the succeeding cartridge, substantially in the manner described.

Seventh, Discharging the empty cartridge cases automatically into a chamber in the stock of the gun, where they may be preserved for future use.

Eighth, Holding the loaded cartridge at the moment of explosion in an open chamber in such manner that the cartridge itself shall form a prolongation or extension of the bore of the gun.

Ninth, So arranging the fluted rollers, F F', that the semi-diameter of the loaded cartridge lying thereon shall project into the plane of the tube, B, to prevent the escape of more than one cartridge therefrom at a time.

Tenth, The lock composed of the hammer, J, mainspring, i, trigger, S, trigger spring, s, and cocking lever, I, arranged substantially in the manner described, in combination with the conveyer, G, for the purpose set forth.

Eleventh, The combination of the conducting tube, H, and fluted rollers, F F', or their equivalent, substantially in the manner and for the purpose described.

Twelfth, The guides, d, in combination with the breech, D, and fluted rollers, F F', or their equivalent, substantially in the manner described, for the purpose set forth.

1,313.—A. B. Smith, of Clinton, Pa., for an Improvement in Raking Attachments to Harvesters:

I claim the cam, P, constructed, arranged and operating in combination with the spring detents, Q R, and guide plate, b, substantially as specified, for the purpose of turning the rake up and down at the termination of its backward and forward movements.

I also claim the combination of the arm, S, and stop, s, for giving the additional forward and downward motion to the rake at the termination of its forward movement with the mechanism for operating the grain or sheaf guard, whereby the gavel is discharged in a compact form, substantially as described.

I also claim the sheaf guard, arranged and operating in combination with the rake, substantially in the manner and for the purpose specified.

I also claim the compressing arms, i i, arranged and acting in combination with the rake and sheaf guard, substantially as and for the purpose specified.

I also claim the combination and arrangement of the cam, L, vibrating lever, K, and arm, M, constructed substantially as described, for communicating the required positive motion from the driving shaft to the sheaf guard.

1,314.—H. R. Stover, of Lancaster, Pa., for an Improvement in Seeding Machines:

I claim the seed roller, A, having seed cells, c c c, open at one end, and formed by the diagonal partitions, b b b, and flange, d, substantially as and for the purpose set forth.

1,315.—Jacob Strayer, of Miamisburg, Ohio, for an Improvement in Seed Drills:

I claim making the teeth on one part or portion of the feeding roller for seed drills opposite the spaces between the teeth on the other part or portion of said roller, substantially as described, so as to deliver or discharge the seed more uniformly.

1,316.—Charles Titterton, of Rohampton, Great Britain, for an Improvement in the Preparation of Oxyd of Zinc for a Paint. Patented in England November 4, 1856:

I claim the subjecting of oxyd of zinc, when contained in a strong holder, to a great pressure, by hydraulic, screw, or other powerful presses, as described, whereby the density is greatly increased and its covering powers brought to nearly equal white lead, overcoming a great objection hitherto existing to the use of white oxyd of zinc.

1,317.—Robert Watson, of Chatham, Ill., for an Improvement in Permanent Railways:

I claim the employment, in connection with the rails, of wrought iron chairs of the same length as the rails, constructed and arranged in the manner described, so as to form a continuous bed or groove for the reception and support of the rails, all as set forth.

[The object of this invention in permanent railways is to secure a more permanent and durable support for rails known as the reversible H-rail, which has two rolling tables or surfaces that can be used alternately as one surface wears down.]

1,318.—C. Weitman, of Independence, Iowa, for an Improved Broom:

I claim the two wire frames, B B, united to or forming a part of screw rod, A, and otherwise constructed as described, in combination with the slide, g, the conical cap, C, and screw handle, D, all arranged as and for the purposes set forth.

[The object of this invention in brooms is to so construct the parts which confine the wisps of broom corn that any person, although unskilled in the art of making brooms hitherto used, may take an old, useless broom to pieces, and substitute new wisps of broom corn for the old ones.]

1,319.—M. G. Wilder, of Meriden, Conn., for an Improvement in Sewing Machines:

I claim the combination of the shaft or stock of the looper with a pitman that rises and descends in directions transverse to the longitudinal movement of the looper, by means of plates fitted with inclined projections, whereby an intermittent lateral movement is imparted to the looper, substantially as set forth.

I also claim the combination of the looper shaft or stock with a pitman operated by a crank pin, by means of a pin and slotted cam plate, the form of the cam slot being such that the point of the looper, when moving in both directions, is caused to pass by the back of the needle sooner than it would if moved by the crank pin alone, substantially as set forth.

I also claim the combination of the shaft or stock of the looper with a pitman, by means of blocks or plates fitted with inclined projections, and with a pin and cam slot, whereby the before-described longitudinal and lateral movements of the looper are derived from the movement of a pitman operated by a crank pin, substantially as set forth.

I also claim the combination of an eye-pointed looper with a hook at its butt, substantially as set forth.

1,320.—S. R. Wilmot, of Brooklyn, N. Y., for an Improved Basket for Berries:

I claim a basket for berries constructed of sheet metal strips or plates cut and bent in the form as shown, and used in connection with the plates or disks, B C; all arranged as shown to form a new and improved article of manufacture for the purpose specified.

1,321.—J. N. Wilson, of Mount Bethel, Pa., for an Improved Washing Machine:

I claim the combination of the horizontal, rotating, rubbing wheel, D, and suds box, B, arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain a machine by which full control may be had over the rubbing action, equally so as if the rubbing were done manually in an ordinary washtub, and thereby prevent the clothes being injured by an undue rubbing, and, at the same time, admit of the work being expeditiously done.]

1,322.—Henry Winter, of Albion Place, Hackney, County of Middlesex, England, for an Improved Machine for Weighing Sacks. Patented in England September 15, 1859:

I claim a machine or apparatus of the construction substantially as described, and for the purpose set forth.

1,323.—C. B. Wood, of New York City, for an Improvement in Carriages:

I claim the arrangement, in the manner shown and described, of the bar, G, and springs, E, with the springs, F, and carriage body, A, all as set forth.

1,324.—George Wood, of Strasburg, Pa., for an Improved Field Bucket:

I claim the lid, E, with slots, H, in combination with the grooved adjustable bars, F, extending across the upper and lower sides of the lid, for the purposes set forth.

1,325.—J. E. Wootten, of Philadelphia, Pa., for an Improved Hydrostatic Pressure Indicator:

I claim the ram, G, the cylindrical opening, x, in the block, E, and the permanent, self-tightening packing, h, when the said block is of an appropriate shape for forming a communication between the said opening, x, and the space beneath the ram of an hydrostatic press, and when the whole is combined with an elliptical or other suitable spring, the pointer, Q, graduated index plate, D, and the devices described, or their equivalents, for transmitting the motion of the spring to the pointer, substantially in the manner and for the purpose set forth.

1,326.—Linus Yale, Jr., of Philadelphia, Pa., for an Improved Lock:

I claim, first, The piece, E, or its equivalent, used in the manner or an equivalent manner, and for the purpose substantially as described.

Second, The parts, D D D D, or their equivalents, deriving motion in the manner substantially as described.

Third, The piece, C, or its equivalent, with its arm, g, for the purpose and object described.

1,327.—Linus Yale, Jr., of Philadelphia, Pa., for an Improvement in Locks:

I claim the application to locks of the parts, E e1 e2 d and M, or their equivalents, for the purpose and object substantially as described.

1,328.—James Young, of New York City, for an Improvement in Electro-magnetic Bathing Apparatus:

I claim, first, The combination of a bath tub with non-conducting sides and bottom, with metallic conducting ends, each end attached—the head to the positive, and the foot to the negative pole of a helix, or *vice versa*, substantially as and for the purpose set forth.

Second, The employment of insulated rockshafts, b, supplied in combination with the supporting rods, a a', and with the tub, A, substantially as described, for the purpose of imparting to the tub an oscillating motion, while, at the same time, its insulation is preserved.

Third, The arrangement of the adjustable metallic plates, i i', in the steam jacket, E, in combination with the electro-magnet, M, as described, for the purpose of supporting certain parts of the body and of passing the current through certain portions of the body of the patient.

Fourth, The combination of an electro-magnet, M, bathing tub, A, and metallic vessel, H, with a rose, m, constructed and operating as and for the purpose set forth.

Fifth, Wrapping the sponge, s', round a copper ball, s, as and for the purpose specified.

Sixth, So combining the swinging tub, A, switch, N, and electro-magnet, M, that by the oscillating motions of the tub the current is changed.

Seventh, The combination of the bathing tub, A, electro-magnet, M, metal strips, q q', and brakes, r r1 r2 r3 r4 r5 r6, constructed and operating substantially as and for the purpose set forth.

Eighth, So arranging the top rail, a*, on the sides of the tub that the same projects over inside and outside, in the manner and for the purpose described.

[This apparatus provides for administering a hot-air or Turkish bath, sulphur vapor bath, steam vapor or Russian bath, medicated herbal-vapor bath, electro-magnetic bath, or ordinary water bath.]

1,329.—C. R. Alsop, of Middletown, Conn., assignor to J. W. Alsop, of New York City, for an Improvement in Revolving Fire-arms:

I claim, first, Combining the oscillating cam, H, with the cocking lever, so as to be operated by and with the said lever, to permit the backward longitudinal movement of the cylinder, substantially as described.

Second, I claim the spring, K, applied and operating in combination with a stud or projection, t, on the side of the oscillating cam, H, to produce the necessary movement of the said cam to give the cylinder the forward longitudinal movement, substantially as set forth.

Third, I claim effecting the cocking of the hammer by means of a stud or projection, s, on the side of the oscillating cam, H, substantially as specified.

Fourth, I claim placing the spring, b, by which the backward longitudinal movement of the cylinder is produced within the axis pin itself, substantially as and for the purpose specified.

Fifth, I claim combining the axis pin, D, with a pin, F, which attaches the rammer shell to the frame, A, by means of the spring, b, the pin, c, and the notch, e, all applied and operating substantially as described.

Sixth, I claim the hanging of the trigger and sere on the axis pin of the cam by which the forward longitudinal movement is produced, substantially as described.

Seventh, I claim the hanging of the cocking lever, J, on the axis pin of the cam by which the forward longitudinal movement of the cylinder is produced, substantially as described.

Eighth, The employment of the same pin, I, as the axis of the cam, H, and the fulcrum of the cocking lever, the trigger and the revolving lever or dog, substantially as specified,

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Ninth, Combining the axis pin, I, of the cam by which the forward longitudinal movement of the cylinder is produced, with the movable side plate of the stock, by means of the countersunk hole in the said plate, and the screw, 20, passing through the said plate and screwing into the said pin, substantially as and for the purpose described.

Tenth, Making the locking and stop notches, i i, in the periphery of the rear journal of the rotating cylinder, substantially as described.

[This invention consists in certain improvements in the means of obtaining a longitudinal movement of the many-chambered cylinder, for the purpose of forcing it tightly up against the barrel, to make a tight joint therewith at the time of firing, and of drawing it back out of contact therewith previous to its rotary movement. It also consists in certain improvements in the mechanism for effecting the cocking of the hammer, and the rotation and stoppage of the cylinder, and in the mode of applying the trigger.]

1,330.—Moses Ducharme (assignor to himself and George Ducharme), of Cohoes, N. Y., for an Improvement in Locks:

I claim the combination of the latch bolt, A, shackle, B, escutcheon, C, and spring tumbler and escutcheon spring, D J, all constructed and arranged substantially as shown and specified.

And I also claim the construction of the front plate, E, with notched lugs, y, and the back plate, h, with corresponding slots, z, as and for the purposes set forth.

1,331.—C. H. Leffingwell, of Providence, R. I., assignor to himself and P. B. Carpenter, of North Providence, R. I., for an Improvement in Boot Legs:

I claim a boot leg constructed of the pieces, A D D F and E, cut in the shape represented in the drawings, with the elastic pieces, G G, introduced in the manner and for the purposes set forth.

[The object of this invention is to obtain a close, stocking-fitting boot leg which may be cut to fit any sized or shaped leg, and to give ease in putting on a boot, and also to effect a great saving in stock.]

1,332.—C. O. Luce (assignor to himself, I. M. Strong and I. F. Eastbrook), of Brandon, Vt., for an Improved Washing Machine:

I claim the arrangement of the racks, j, pinions, i, shaft, E, and rollers, l, with the stems, k, pounders, F, rotary tub, A, shaft, D, and gearing, f g e e B; all as shown and described, for the purposes set forth.

[This invention consists in the arrangement of a tub rotated by means of a toothed ring at its bottom and on its outside, in combination with a series of rising and falling pounders arranged in the interior of the tub, and on one side of the same, in such a manner that, by the rotary motion of the tub, the clothes contained in the same are successively exposed to the action of the pounders.]

1,333.—George Murray (assignor to himself and Sarah H. Hilbert), of Cleveland, Ohio, for an Improvement in Water Elevators:

I claim, first, The circular spout, N N′, in combination with the double oblique valves, L L′, when the same are constructed, arranged and operated as and for the purpose set forth.

Second, I claim the arrangement of the pulleys, C D, for the purpose of compressing the rope in order to prevent its slipping, as specified.

1,334.—Joseph Neumann (assignor to G. W. Robertson), of Philadelphia, Pa., for an Improvement in Hydrants:

I claim the case or guard, B, in combination with the upper end of the barrel of a hydrant cock, the said case or guard being constructed and applied to the cock, substantially in the manner described and for the purpose specified.

1,335.—John Range (assignor to J. and E. Parker), of Meriden, Conn., for an Improved Thumb Latch:

I claim the slide bolt, B, attached to a frame or plate, A, and provided with a spring, d, and the central bow-shaped part having double-beveled surfaces, b b′, in connection with the thumb piece, D, and with or without the botton, G, as and for the purpose set forth.

[The object of this invention is to obtain a simple and economical thumb latch which may be applied to either a right or left hand door, and be capable of being locked or buttoned at the side of the door on which the slide bolt of the latch is placed.]

1,336.—S. Roberts (assignor to himself and Alfred Adams), of Cleveland, Ohio, for an Improved Barrel:

I claim the making of the cylinder part of barrels of a volute piece or pieces, having gore or wedge-shaped pieces cut from each end, as described, for the purpose of forming the proper bulge to the body of the barrel, in the manner set forth and described.

1,337.—W. D. Wood, of Wilmington, Del., assignor to A. Wood, of Philadelphia, Pa., for an Improvement in the Manufacture of Sheet Iron:

I claim, first, Removing the scales of oxyd of iron from the plate of iron in the manufacture of sheet iron, by annealing it and then passing it successively between corrugated and plain rolls or presses, substantially as described.

Second, The coating of the plates of iron with graphite or plumbago, or other carbonaceous matter, ground in oil prior to the finishing process, in the manner and for the purpose substantially as set forth.

Third, The coating of the rolls with graphite or plumbago, or other carbonaceous matter ground in oil, for the purpose of finishing the outer surfaces in the manner described.

1,338.—L. L. Miller, of Jersey Shore, Pa., for an Improved Washing Machine:

I claim, first, The arrangement of the rubber, E, handle, H, slides, I, studs, b, volute springs, K, and hand lever, J, the whole being constructed, combined and operated in the manner and for the purpose shown and explained.

Second, The combination and arrangement of the boxes, L L, rollers, D D, and tub, A, constructed and applied in the manner and for the purposes shown and explained.

RE-ISSUES.

78.—F. J. Seymour, of Waterbury, Conn., assignor to the Waterbury Brass Company, for an Improvement in Making Brass Kettles. Patented May 13, 1856:

I claim, first, The production of kettles and articles of similar character, by the combined processes of stamping, to produce a preliminary shape and spinning to complete the ultimate or finished form, substantially as described.

Second, I claim the new method or process, substantially as described, of stamping up vessels by a mode of operation in which the bottom is stamped up first and the sides are then formed or drawn in successive lengths by means of dies, substantially as set forth; and this I claim whether the vessel be entirely finished by this new stamping process, or whether it be completed by a spinning process, subsequent thereto.

79.—J. R. Robinson, of Boston, Mass., for an Improvement in Steam Boiler Furnaces. Patented March 5, 1861:

I claim, first, The gas-mixing chamber, B, constructed in the rear of the bridge well, C, with a covering arch, F, and openings, d d, in the said arch, substantially as described.

Second, Providing a boiler furnace with one or more trunks, e, or equivalent independent outlets from the fire chamber for the exit of the lighter gases of combustion, substantially as specified.

Third, The combination of one or more trunks, e, with a gas-mixing chamber, B, substantially as specified.

80.—John Brayley, of Buffalo, N. Y., administrator, and Mary Pitts, of Buffalo, New York, administratrix, of the estate of John A. Pitts, deceased, late of said Buffalo, for an Improvement in Horse Power. Patented July 4, 1854:

I claim, first, So combining an internal gear main driving wheel with two pinions working at diametrically opposite sides thereof, as that the said main wheel may move in a direction transverse to that of a line drawn through said pinions, for the purpose of allowing said main wheel to automatically adjust itself to said pinions, substantially as and for the purpose set forth.

Second, Hanging the pinions of a double-geared horse power in adjustable bearings, so that they may be set close mesh with the main or master wheel, substantially as described.

Third, In so combining the pinions and bevel wheels upon one shaft in pairs, and supporting them in adjustable bearings, as that their shafts may be kept in a perpendicular position, whilst the two gears are made adjustable to the respective wheels that they mesh with, substantially as described.

EXTENSIONS.

Anson Atwood, of Troy, New York, for an Improvement in Cast Iron Wheels for Railroad Carriages. Patented March 20, 1847; re-issued June 9, 1857:

I claim the connecting of the rim of the wheel with the hub in cast iron car wheels by means of two curved plates, starting from near the ends of the hub and joining at a part of the distance between it and the rim, thus forming a hollow ring or arch around the hub, and joining said ring with the rim by a single plate, or its equivalent, for the uses and purposes set forth.

Anson Atwood, of Troy, N. Y., for an Improvement in Cast Iron Wheels for Railroad Carriages. Re-issued Sept. 22, 1857:

I claim connecting the rim of a wheel cast in one piece with a solid hub by means of a single waved plate, in combination with the dished flanch or flanches of the hub, forming a ring concentric with the rim of the wheel, substantially as described, whereby the several parts can yield to the unequal contraction in all directions without serious strain of the metal.

Anson Atwood, of Troy, N. Y., for an Improvement in Cast Iron Wheels for Railroad Carriages. Re-issued Sept. 22, 1857:

I claim a cast iron disk, corrugated in the manner substantially as and for the purposes described, when used in connection with the chilled rim of a cast iron wheel.

P. W. Gates, of Chicago, Ill., for an Improvement in Dies for Cutting Screws. Re-issued May 7, 1847:

I claim the forming of such dies of one solid block, in such manner as that they shall cut a perfect screw by the once passing of it along the piece to be cut, this being effected in the manner set forth, that is to say, by the forming of acute cutting edges on the threads within the die, which threads are to be regularly reduced in hight from the upper to the lower face thereof, at which part the last terminating thread is obliterated, and by the filing away of a large portion of the threads, as shown at B B, and by the curves, e m and f m; the cutting edges being also furnished with throats for the escape of the cuttings, as made known and represented, and the whole apparatus being arranged, combined and operating substantially in the manner and for the purpose set forth.

DESIGN.

Garretson Smith and Henry Brown (assignors to Liebrandt & McDowell), of Philadelphia, Pa., for a Design for Cooking Stoves.

NOTE.—The number of patents issued on the 14th of May, and reported above, amounts to seventy-one; out of this number, TWENTY-SEVEN were secured through the Scientific American Patent Agency.

Notes and Queries

R. W., of N. Y.—The centrifugal gun of Robert McCarty, of this city, which has recently been brought prominently before the public, was patented on the 1st of December, 1838. The patent has therefore expired. D. J. Martin, of Louisville, Ky., obtained a patent for an improvement on this gun on the 3d of August, 1840.

O. C. K., of Conn.—Bronzing powders are mostly made in Germany, from compositions of tin. You may use them mixed with any varnish, then burnish them when dry, or you may put on the varnish first, and dust the powder on the top.

C. O. G., of Wis.—You can make your floor perfectly water-tight by placing a cement in the same, composed of white lead and pounded glass. Or, if you cannot obtain pounded glass, use dry-slaked lime as a substitute. It must be allowed to dry perfectly before you use water to wash it. The cement should be applied about the consistency of putty.

J. M. H., of N. Y.—A very good cement for fastening glass standards into wooden frames is composed of a strong solution of glue and plaster-of-paris, or fine chalk. Dissolve the glue in water, then add the plaster until the composition is of the proper thickness. Apply this cement quickly, as it dries rapidly.

H. S., of Mass.—In our description of firing with Hotchkiss' shot, wherein it is stated that the iron cannon used was 2½ inches bore and 4 inches long, there is a misprint. It should have been 4 *feet* long.

J. A., of Ill.—Puddled steel is allowed to be at least twice as strong as cast iron. We know not where you can obtain castings of this metal, varying from five to twenty-five pounds in weight. In all likelihood you can obtain malleable iron castings of all sizes in Chicago.

W. de S., of Pa.—Address the Secretary of the Navy for a copy of the Report of Naval Engineers.

T. McEl. H., of Wis.—A metal roof, if put on properly, is certainly better than one of cement. A good cement roof, however, is made by taking equal quantities of tar and asphalt, boiling them together for one hour at least, then stir in some perfectly dry, sifted lime until it becomes of the proper thickness. Put it on hot upon felt or thick tar paper, and cover the whole with dry sand and fine gravel. Lay it on in successive coats of about three square yards at once, and beat the gravel on the top with a shovel.

W. J., of Cal.—On page 275, Vol. X. (old series), of the SCIENTIFIC AMERICAN, you will find a recipe for destroying red ants. Take a large sponge, wet it, then squeeze out the water, and sprinkle some powdered sugar over it so as to fill the pores. Now place it in the vicinity of the ants' nests, and in a short period it will be filled with the insects, when it should be lifted and plunged into a vessel of boiling water. Pursue this system persistently, and you will ultimately rid your premises of these pests.

L. K., of Pa.—A preparation of india-rubber and cork, called "kamptulicon," was experimented with as a protective coating for iron ships in 1850. You will find a brief description of these experiments on page 62, Vol. VI. (old series), of the SCIENTIFIC AMERICAN.

H. S., of Mass.—A 12-pound rifled cannon shot measures 3¼ inches in diameter at the base, and is conical shaped.

W. W. B., of Pa.—We have received a great many communications on the subject of aerostation, but have published only those which we supposed would interest our readers. We wrote you a long time ago that we should probably not publish your communication.

H. C., of N. Y.—When we find some definite and authentic intelligence in regard to the gold of Nova Scotia we shall publish it.

J. E. B., of Ohio.—The best pale varnish for carriages is made by mixing 2½ gallons of hot boiled linseed oil with 8 pounds of pale African copal gum fused in an iron vessel. About ¼ pound of sulphate of zinc should be added slowly to the mixture, and the whole boiled until it becomes stringy. It is next thinned down with turpentine, for use. This varnish dries in about 4 hours in summer, and is used for the outside work. It is durable and quick-drying.

G. E. S., of Ill.—Mr. Fairbairn, of England, is the author of a work on iron bridges. You could obtain it through some importing house, such as J. Wiley, or Ballière Bros., this city.

E. L., of Pa.—The experiments of Mr. Charles H. Haswell, of this city, have shown that the dynamical effect of a falling body is equal to its weight multiplied by its velocity in feet per second and by 4.426. A weight falling 80 feet would have a velocity, in round numbers, of 72 feet per second, and if its weight were 3,000 pounds, it would compress a spiral spring to the same extent as a weight of 954,000 pounds resting upon it.

H. G. G., of N. Y.—Carbonic acid gas is heavier than atmospheric air, still it does not fall and occupy the lowest stratum of the atmosphere, owing to a singular property which gases have of mixing together. When two gases of different densities are placed in the same vessel, though the heavier one be at the bottom, it is found that they gradually mingle completely together, forming a homogeneous mixture. The particles of gas are so far apart that they do not prevent another gas from ultimately occupying the same room, but they do obstruct the entrance of the second gas into the same space, rendering it more slow.

D. H. S., of Conn.—D. Appleton & Co., of this city, published a work on mechanical drawing, a few years ago.

M. K., of Ill.—To practise drilling an artillery company of volunteers, if you are going to use heavy cannon—say 24-pounders—they can be cast of iron; any foundry can do it. But if the company is to be of flying artillery, you want brass 6-pounders. These are expensive, but as the metal would always be valuable, the expense would be little more than the interest on their cost. Dahlgren guns are very heavy for stationary batteries, and are unsuited for field perations.

C. H. G., of Vt.—We believe that Wesson has ceased to manufacture rifles, but the same style of gun is made under the Clark patent by James, of Utica.

A. B. W., of N. Y.—The proportion of the feed pump or cylinder of an air engine to the working cylinder will depend on the temperature at which the air is used. Atmospheric air, like other gases, expands 1-493 of its bulk at 35° for each degree that its temperature is raised; that is, it takes an increase of 493° to double its bulk.

E. F., of Wis.—A process has been patented by A. Steers, of this city, for extracting the tannin from bark, whereby it is obtained in a very concentrated form for tanning leather. We have been informed that the extract retains all the qualities of the bark for tanning purposes.

J. P. & L. S., of Ind.—There can be no lime in the steam which you employ for heating your dyestuffs, and you should not blame the steam for the bad colors in your dye house.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, May 29, 1861:—

B. & R., of Ohio, $15; M. D. W., of Ind., $25; A. & H., of Cal., $25; E. L. E., of Conn., $15; A. & C., of N. Y., $400; W. P., of N. Y., $15; S. M. R., of Mass., $15; L. & P., of Pa., $31; J. O. F., of Mass., $25; J. A., of Pa., $25; D. P. F., of Mass., $25; E. D. W., of Pa. $43; L. D. B., of N. Y., $20; A. C., of N. H., $20; E. C. W., of N. J., $43; H. L. B., of Conn., $20; H. W. H., of Conn., $20; W. B. S., of N. Y., $25; A. W., of Vt., $25; A. S., of N. Y., $30; R. McC., of N. Y., $25; F. N., of Conn., $30; E. A. K., of Conn., $15; D. E. T., of N. Y., $15; J. C., of Pa., $25; W. D., of Mo., $10; L. & W., of Mass., $25; W. & M., of N. H., $40; C. Van N., of N. Y., $20; W. J. S., of N. Y., $22; N. C. P., of N. H., $20; S. A. B., of Conn., $20; W. S. K., of Conn., $20; G. L. K., of Pa., $15; M. W. M., of N. Y., $15; M. A. D., of Mich., $12; U. B. V., of Pa., $25; W. N. D., of Cal., $35; A. H. T., of N. J., $40; D. McK., of N. Y., $15; J. W. C., of Mich., $30; L. D. G., of N. J., $20; T. S. & T. W. R., of N. Y., $25; A. C., of Mass., $10; A. M. H., of Conn., $20; J. R. R., of Mass., $40; E. F. H., of N. Y., $20; J. S. P., of Conn., $20; D. B. S., of Mass., $22.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from May 22 to Wednesday, May 29, 1861:—

D. B. S., of Mass.; M. D. W., of Ind.; A. W., of Vt.; C. K. H., of Cal.; J. L. T., of N. Y.; F. N., of Conn.; U. B. V., of Pa.; L. & W., of Mass.; J. A., of Pa.; E. C. W., of N. J.; T. C., of Cal.; R. McC., of N. Y.; A. N. R., of N. Y.; W. H. D., of Cal.; J. C., of Pa.; T. S. & T. W. R., of N. Y.; D. P. F., of Mass.; E. D. W., of Pa.; J. H. F., of Ky.; M. A. D., of Mich.; W. D., of Mo.; A. C., of Mass.; J. H. L., of Pa. J. O., F., of Mass.; W D., of R. I.

TO OUR READERS.

Models are required to accompany applications for Patents under the new law, the same as formerly, except on Design Patents, when two good drawings are all that is required to accompany the petition, specification and oath, except the government fee.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

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CHANGE IN THE PATENT LAWS.

NEW ARRANGEMENTS---PATENTS GRANTED FOR SEVENTEEN YEARS.

The new Patent Laws, recently enacted by Congress, are now in full force, and promise to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from **$30** down to **$15**. Other changes the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for Design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, except in reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian, Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees, at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time, and on the most liberal terms.

Testimonials.

The annexed letters, from the last three Commissioner of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

MESSRS. MUNN & CO.:—Gentleman: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent, &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. Over 1,500 of these examinations were made last year through this Office, and as a measure of prudence and economy, we usually advise Inventors to have a preliminary examination made. Address MUNN & CO., No. 37 Park-row, New York.

Caveats.

Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The government fee for a Caveat, under the new law, is $10. A pamphlet of advice regarding applications for Patents and Caveats furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row New York.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention, if susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition is composed, for the Patent Office. These should be securely packed, the Inventor's name marked on them, and sent, with the government fee, by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO No 37 Park-row New York.

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, inclosing the official letters, &c.

Foreign Patents.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business, we have offices at Nos. 66 Chancery-lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

Circulars of information concerning the proper course to be pursued in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our Branch Offices.

Interferences.

We offer our services to examine witnesses in cases of interference, to prepare arguments, and appear before the Commissioner of Patents or in the United States Court, as counsel in conducting interferences or appeals.

For further information, send for a copy of "*Hints to Inventors.*" Furnished free. Address MUNN & CO., No. 37 Park-row, New York.

The Validity of Patents.

Persons who are about purchasing Patent property, or Patentees who are about erecting extensive works for manufacturing under their Patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing Patent, before making large investments. Written opinions on the validity of Patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars, address MUNN & CO., No. 37 Park-row, New York.

Extension of Patents.

Valuable Patents are annually expiring which might be extended and bring fortunes to the households of many a poor Inventor or his family. We have had much experience in procuring the extension of Patents; and, as an evidence of our success in this department, we would state that, in all our immense practice, we have lost but *two* cases, and these were unsuccessful from causes entirely beyond our control.

It is important that extension cases should be managed by attorneys of the utmost skill to insure success. All documents connected with extensions require to be carefully drawn up, as any discrepancy or untruth exhibited in the papers is very liable to defeat the application.

Of all business connected with Patents, it is most important that extensions should be intrusted only to those who have had long experience, and understand the kind of evidence to be furnished the Patent Office, and the manner of presenting it. The heirs of a deceased Patentee may apply for an extension. Parties should arrange for an application for an extension at least six months before the expiration of the Patent.

For further information as to terms and mode of procedure in obtaining an extension, address MUNN & CO., No. 37 Park-row, New York.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

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Trade of New York.

The general business of this city is dull; money and soldiers abundant. The exports for the month of April amounted to $11,109,700; imports, $14,886,400; revenue, $1,643,300. The amount of exports last year in April were $10,371,410; imports, $16,971,400; revenue, $2,444,300. The total value of exports for ten months amount to $126,586,000. The amount of specie received here since January 1st to April 1st from California is $13,130,148; amount received from abroad during the same time, $17,035,703. The war, however, has given an immense impulse to some kinds of business. Two heavy clothing houses in this city have contracts with the government for uniforms amounting to upwards of $250,000 each. All the woolen mills are full of orders for the gray cloth for soldiers' uniforms, and an unwonted impetus has been given to the manufacture of caps, shirts, blankets and firearms of all descriptions, while several large mills are weaving tent cloth. The Collins Company, of Collinsville, are making 7,500 sabres for the Sharp's rifle company. The receipts of the New York Central Railroad for the year ending May 1st are $7,449,699, being an increase of $948,784 over last year.

To Place Water in a Drinking Glass Upside Down.—Experiments of this kind are not only amusing but instructive; they illustrate what at first sight appears to be the "laws of Nature reversed," while, in truth, when we are familiar with them, they teach the "immutability of Nature's laws." The more experiments a boy makes, the greater number of rounds will he ascend up the "Ladder of Learning;" and when he is at the top, how bright is the prospect before him. All is beautiful, wonderful and lovely. Then can he come down, and

> Find tongues in trees, books in the running brooks,
> Sermons in stones, and good in everything.

But to our paradox. Procure a plate, a tumbler and a small piece of tissue or silver paper. Set the plate on a table, and pour water in it up to the first rim. Now very slightly crumple up the paper, and place it in the glass; then set it on fire. When it is burnt out, or rather just as the last flame disappears, turn the glass quickly upside down into the water. Astonishing!—the water rushes with great violence into the glass! Now you are satisfied that water can be placed in a drinking glass upside down. Hold the glass firm, and the plate also. You can now reverse the position of the plate and glass, and thus convince the most skeptical of the truth of your pneumatic experiment. Instead of burning paper, a little brandy or spirits of wine can be ignited in the glass; the result of its combustion being invisible, the experiment is cleaner. —*Septimus Piesse.*

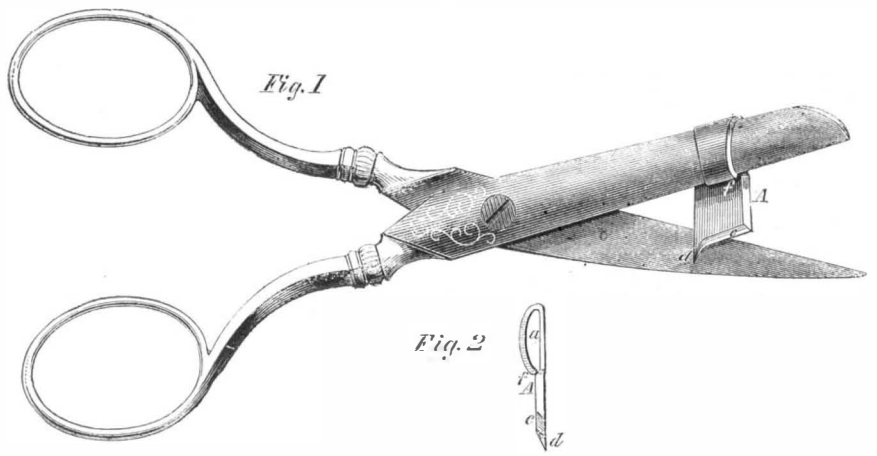
Several cast steel guns have lately been tried at Gavre, France. The London *Mechanics' Magazine* states that these guns carry about 1,300 yards, and, at 300 yards distant, they pierce through plates as thick as those of the frigate *La Gloire*. The projectiles thrown weighed 95 lbs. each.

For ninety days, during the suspension of launching the *Great Eastern*, she was suspended on two cradles 110 feet apart, and yet she was deflected only half an inch from her true lines. This afforded evidence of her vast strength.

Improved Button-hole Cutter.

Implements for cutting button-holes have been in use for some time, and they are found to greatly facilitate the work, cutting all the holes of precisely the same size and with remarkable rapidity. We here illustrate a neat little cutter, which may be slipped upon one of the blades of ordinary scissors, furnishing a button-hole cutter very cheap and of small bulk.

The device is so plainly illustrated in the engraving that it will be understood at a glance. A steel plate, A, with a beveled edge, *c*, and a point, *d*, is formed with a loop, *a*, to be slipped upon one blade of the scissors, as shown. The point, *d*, first punctures the cloth and renders the operation more easy. The loop operates as a stop to prevent the scissors from cutting the cloth. When not required, the plate can be instantly removed, leaving the scissors ready for their ordinary use. As each of the cutters forms holes of only one size, they are sold in sets of various sizes.



FEARING'S IMPROVED BUTTON-HOLE CUTTER.

The patent for this invention was granted through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the inventor, J. J. Fearing, at South Weymouth, Mass.

HALL'S DRINKING TUBE.

We here present an illustration of the first of the inventions in this line, destined for the special accommodation of our soldiers. It is a small india-rubber tube, with a filter at the end for the convenience of drinking from any brook or river that may be met with on the march.

At the upper end of the tube is the mouth-piece, *a*, Fig. 2, made of hard india-rubber, and at the lower end is the small filter, B. This filter consists of a cup of hard india-rubber, closed at the bottom by a cap, which is perforated with numerous very small holes for straining the water. The inner cavity of the cup is nearly filled with a bit of sponge, *c*, to filter the water. As the cap screws into the cup, B, it may be removed whenever it is desired to take out the sponge for the purpose of cleansing it.

With a tube four feet or less in length, the whole apparatus is so compact that it may be carried without inconvenience in the pocket, and the material of which it is composed is not subject to injury, breakage or decay, while it enables the apparatus to be furnished at a trifling cost. This little instrument will be found equally convenient for travelers, hunters and surveyors, as well as for soldiers, for whom, at the present time, it is specially adapted.

The patent for this invention was procured through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the patentee, Henry A. Hall, at Boston, Mass.

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The SCIENTIFIC AMERICAN has the reputation, at home and abroad, of being the best weekly publication devoted to mechanical and industrial pursuits now published, and the publishers are determined to keep up the reputation they have earned during the SIXTEEN YEARS they have been connected with its publication.

To the Inventor!

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